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A MECHANICAL ACCOUNT OF *FEVERS.*

By LAURENTIUS BELLINI, M. D.
And Profeſſor of Phyſick in the Univerſity of *Piſa.*

Done into *Engliſh:* With a large Explanatory Introduction; helping the better to underſtand ſome other Writings alſo of the ſame Author.

LONDON,

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THE PREFACE.

A*LTHOUGH the Name of* Bellini *and his Writings, are both well known and eſteemed amongſt the greateſt Judges; yet it may perhaps be acceptable to many Readers, for whoſe Uſe this Tranſlation is chiefly deſigned, to be ſomewhat particularly informed of the Means and Advantages by which this wonderful Man made ſuch ſurprizing Diſcoveries and Improvements in the Theory of Medicine.*

A ſmall Acquaintance with Books, and the State of Learning for the laſt Age, will teach any one how much the World hath been obliged to the Italians *for their Advancement of the moſt ſubſtantial Philoſophy, and leading into the only Means of arriving to the Knowledge of Nature, by Experiments, and Mechanical Reaſonings thereupon: This happy Turn had its due Influences alſo on the Study of Medicine; and* Malpighi, Redi, Steno, Borelli, *with many others, laid a ſure Foundation in Anatomy, and the Knowledge of what an Animal was in its natural State; and* Borelli *in particular, by his Application to Mechanicks, and the Laws of Motion, taught how to account for the Powers of the Muſcles, and the more bulky Inſtruments of the humane Frame. But it was his Scholar* Bellini, *the Author now before us, who firſt taught, upon the ſame Principles and Conduct, to reaſon demonſtratively about the more minute, and more unheeded Agency of the animal OEconomy; and he firſt carried the Underſtanding*

ſtanding into the moſt obſtruſe and remote Scenes of Operation, with the ſame Clearneſs and Evidence, as it had been accuſtomed to in Matters much more open to the Senſes.

By this it appears that our Author had not only a happy Turn of Thinking himſelf, but alſo a moſt fortunate Conjuncture to exert it, being led by ſuch great Authorities into the only Helps on which any true Knowledge can be built: And of what extenſive Uſe his Writings have been in the Study of Medicine ſince, cannot be unknown to any who have Acquaintance with ſuch Things even but by Report. From ſo great, ſo advantageous an Inſtructor, the World hath ſince enjoyed a Pitcairn, *and hath now the greateſt Profeſſor, that ever filled the ſame Chair at* Leiden; *from him alſo this City hath now to boaſt of the moſt able Phyſicians in Practice; who not only prove Ornaments to their Profeſſion, but their Country, in now teaching to* Europe *by their Writings what they themſelves firſt learn-*

ed from Italy: *Their Names need no Mention, becauſe their Works teſtifie of them to the moſt knowing Parts of the World.*

Yet becauſe the Reader may be more excited in his Attention to the following Pages, by ſome unqueſtionable Teſtimonies already on Record, to our Author's happy Abilities, it may not be amiſs to repeat what Pitcairn *hath ſaid in his Preface to the laſt Edition of his* Diſſertations, *where mentioning the little Regard to the Opinion of thoſe who had not received a Turn to that way of Thinking, which he judged to be the only Foundation of Knowledge in Phyſick, he owned himſelf fully ſatisfyed in the Approbation of a few then living, whom he names, and adds,* Nam BELLINI ad deos abiit, *for* Bellini *is dead. A Compliment not only worthy the Perſon it is applyed to, but alſo very expreſſive of that diſintereſted Elevation of Mind with which the Speaker was moſt ſingularly endewed.*

Further, The laſt Edition of this Work, whereof this is a Part, was under the Care of Profeſſor Boerhaave, *whereunto he prefixes a very juſt and copious Recommendation, and particularly to his Pupils, to whom he thus concludes,* Vos igitur Optimi Medicinæ Tyrones, hunc nocturnâ volvite atque diurnâ manu. *You who I have moſt Eſteem for as Students under me in Medicine, let this Author be your conſtant Study.*

But why the Writings of a Perſon thus much in Eſteem ſhould not ſooner ſpread in other Languages, than that only in which they were wrote, may be accounted for both from the Manner of Reaſoning, whereupon they are ſtrictly conducted, which but very few have been, till lately, acquainted with; and from the particular Style of Bellini, *which, through an uncommon Diligence to keep the Mind cloſe in View of the Subject, and to avoid too much Tranſition in Deduction, runs out into very long Periods, and* *ſeemingly troubleſome to ſuch, who have been accuſtomed to read but with ſlight Attention.*

As to the firſt of theſe Difficulties, we now have it to ſay, that almoſt every Day brings this way of Writing into Repute; and by the Encouragement of ſome great Examples, and the continual Helps from experimental Philoſophy, the growing Age is brought into a Way of Thinking and Expreſſion that abhors every thing deluſory and hypothetical about Objects that are corporeal, and will not be ſatisfyed without ſenſible Evidence, and ſuch demonſtrable Deductions therefrom, as keep in View every intermediate Tranſition from the firſt Principle to the moſt diſtant Concluſion, with as much Clearneſs and Strength of Proof as in a Propoſition almoſt Self-evident: As to the latter Objection, it is endeavoured in this Tranſlation, to avoid as much as poſſible, all the long Sentences and Periods of the Author, by breaking them as much as the Matter and Connection would bear, into ſhorter

ſhorter and more eaſy Concluſions; whereby the Mind is not ſo much wearied in Attention, and the Engliſh *rendered more eaſy even to a* Latin *Reader. And to a Want of this Liberty, it is imagined, may be aſcribed not only the Reaſon why* Bellini *hath ſo long lay untouched in this Nature, but alſo why many Tranſlations are ſo much inferior to their Originals.*

It may not be amiſs here likewiſe to advertiſe, that as to our Author's Method in general, on the following Subject, it is as much conformable to the uſual Diſtinctions of Fevers, as is conſiſtent with his new Manner of treating it. In the Beginning therefore, the chief Diſtinctions of them are enumerated, with the Affections obſerved by common Experience to belong to each particular Diviſion. Then follow general Propoſitions, *ſhewing how the* Antecedents, Concomitants, *and* Conſequences *of all Fevers, do neceſſarily produce certain Changes in the Blood, which are attended with certain*

Symptoms, and followed by certain inevitable Alterations of the Habit; after which, the ſame immediate Cauſe is purſued into all its various Shapes of Exiſtence, as determined by its Antecedents, *and producing all the Variety of Appearances in particular Kinds of Fevers; ſo that the Reader will find all the Way a cloſe Connexion between the firſt Diviſion of Fevers into certain Claſſes, the* general Propoſitions *illuſtrating the common Cauſe of all, and the* particular *Ones, explaining the ſeveral Affections peculiar to every particular Kind.*

If to any it ſhould be a Diſcouragement that herein is nothing extended to particular Practice, ſuch are to be told, that a Maſter in the Theory, aſſiſted by Experience and common Opportunities of Obſervation, wants no ſuch Helps; and that whereſoever ſuch Helps, as particular Forms of Preſcription, come in the Way of any Perſon unskilled in Theory, and the true Foundation of Practice, they are *of no other Uſe, than as ſharp Inſtruments in the Hands of the unskilful, who are likely to do much more Harm with them than Good. The Art of Healing is now as much ceaſed to be the Gift of an Enthuſiaſt, as that of a different Talent, and is now asknowledged to require the Aſſiſtance of humane Reaſon to conduct it; where therefore ſome Knowledge in the Structure of a humane Body, and the Nature of its Diſorders, do not direct to the Means of Remedy, it is more than Ten thouſand to one whether Means otherwiſe ſupplied ever anſwer their End; conſequently whoſoever is well acquainted with the following Theory, will know how to act in every particular Circumſtance; and without ſuch Knowledge, no Choice of Remedies, or particular Directions, will be of Uſe.*

The Reader will likewiſe in many Places here obſerve Mention to be made of other Works of the ſame Author; if therefore the Pains which are here uſed to make this Part concerning Fevers acceptable in

Engliſh, *ſhall hereafter appear to anſwer the End, it may be Encouragement for beſtowing the ſame Labour upon the Reſt. But yet further to bring Writings of this kind into more Eſteem, by being made eaſy to underſtand, there is hereunto prefixed a large* Introduction, *explaining every thing that may be imagined difficult to Readers not yet accuſtomed to mechanical Reaſoning; and which, it is hoped, will not only facilitate their Progreſs through this Work, but make them both more able, and more deſirous to be acquainted with the other Writings of the ſame Author.*

Why in the Title it is called a Mechanical *Account of Fevers, will not want any Apology to thoſe who are rightly acquainted with the Import of that Term;* Bellini *hath truly treated this Subject in that Manner, and that hath been the greateſt Motive to the Tranſlator for his Pains therewith; the more eſpecially too, becauſe he conceives that if Readers of ſuch Subjects could be initiated in-*

to that juſt Way of Thinking, which a right underſtanding them does neceſſarily require, they will ſoon be brought into Contempt of that unmeaning Traſh, and ſurprizing Emptineſs, with which ſome Authors have lately entertained them on like important Subjects.

THE EXPLANATORY Introduction.

BEFORE we go into any particular Explanations of Paſſages, or Terms in the following Pages, which may otherwiſe be difficult to Perſons unaccuſtomed to ſuch a Way of thinking and writing; it may be neceſſary to obſerve, that *Bellini* himſelf hath been ſo much aware of the Occaſion for ſuch previous Inſtructions, that to his Works he hath prefixed ſeveral *preliminary Propoſitions*; thoſe therefore which relate to this Part, here tranſlated, we ſhall firſt give the Reader, with ſuch further Explanations, as may facilitate the main Deſign of underſtanding

ſtanding the Whole aright: And this we ſhall do without any Regard to that Order *Bellini* hath given them; ſelecting them only as they beſt ſuit our Purpoſe for the following Work.

I. *The Blood circulates, as demonſtrated by* Harvey, *&c.*

II. *When the Blood flows out of the left Ventricle of the Heart, its Force through each Trunk of the great Artery will be as the whole* Momentum *of Velocity communicated to it from the Heart; but its Velocity through the whole Length of the Arteries will be only as the Exceſs of that* Momentum *above the Reſiſtances of thoſe Arteries.*

III. *The Volocity of Blood through Arteries, whoſe Origin is from Trunks near the Heart, is greater than in Arteries ariſing from Trunks at greater Diſtances.*

IV. *There is a Liquid in the Nerves that thickens with Heat.*

V. *The Nerves in a natural State are always full of this Liquid, and it is in continual Motion through them; but with a very ſlow Pace, from the Brain towards the extream Parts; and it is ſeparated*

rated by the Glands in the Brain: With the Brain we here alſo include the ſpinal Marrow.

VI. *That Power by which the nervous Liquid is derived from the Glands in the Brain, and ſet into Motion forwards, is a Preſſure ariſing from the Dilatation of the Arteries, woven through the* Pia Mater, *and intimately interſperſed through the whole Subſtance of the Brain.*

VII. *Although this Liquid moves through the Nerves with a continued Pace, yet it does not fall into the Parts, whereinto they open,* continually, *but* alternately; *nor is it neceſſary that the Times between every Efflux ſhould be equal in every Part, for they may be greater or leſſer, yet ſo frequent as to appear continually to diſtil, and produce Effects continually in Operation.*

VIII. *The nervous Liquid alternately diſtils into all the Muſcles, as well thoſe having Antagoniſts, as thoſe which have none; and it exerts an* Impetus *upon all; but where the Muſcles have equivalent Powers it is imperceptible, in others not ſo.*

IX. *Upon the Impreſſion of ſenſible Objects there is a Reflux of this nervous Fluid made in the Nerves, with an* Impetus *exceeding that by which it flows from its Origin.*

X. *The reflux Motion of the nervous Liquid, is always in Waves, whether it be occaſioned by the Impreſſion of ſenſible Objects, or muſcular Contraction.*

XI. *The Tremor or Vibration of a Nerve, and the Undulation of its contained Liquid, is as the* Momentum *of the contractile Muſcles, or the Impreſſion of external Objects.*

XII. *The Tremor of one Nerve will ſhake all thoſe in Confluence with it.*

XIII. *In every Wave of this Liquid, the moſt ſubtile Part, which is called Spirit, will have a* Niſus *from the Centre of every Wave towards the Superficies of the Nerve on every Side, and gradually break through; and this is the very Matter of Perſpiration in a natural State.*

XIV. *The Separation and Derivation of any thing from a liquid, unequally Fluid, and confuſedly paſſing through the Veſſels, is by*

a

a Compoſition of two different Motions, one of which acts longitudinally, that is, parallel to the Axis of the Canal, and the other with a Niſus *againſt its Sides.*

XV. *The thinneſt Part of any Liquid, unequally Fluid and at Reſt, will ſooneſt be forced out by any compreſſive Power.*

Thus far is collected from our Author's own introductory Propoſitions, to his whole Work, as they are ſuch; and ſuch only amongſt them as particularly lead into ſome of the moſt difficult Paſſages of the following *Account:* And what he adds to the whole is likewiſe proper here; *It behoves every Reader to be Maſter of theſe* PRECOGNITA; *nor will any one ſtumble at Obſcurities, who is duly herein inſtructed.* And to be thus far prepared, requires only a tolerable Acquaintance with a humane Body in Health; eſpecially the Conditions of Circulation and Secretion, and with the common Principles of Mechanicks, and the Laws of Motion.

To ſuch therefore the foregoing Propoſitions want not any more particular Explanations, nor will the intelligent Reader need to have it pointed out wherein they are applicable to particular Paſſages, becauſe they will eaſily occur to the Mind from their natural Connexion with one another. Such Things only therefore call for Explanation, which do not neceſſarily flow from any of theſe Premiſſes, and which are often mentioned in the following Work.

And on this Diſtinction comes firſt to our Enquiry the *Lentor*, whereof our Author makes ſuch frequent Mention: To which Purpoſe the Reader is deſired to obſerve, that in many Places the Blood is ſpoke of as being too thick and too thin at the ſame Time, the thickeſt Part therefore in the *Bellinian* Senſe is the *Lentor*; not unlike what is commonly obſerved in all Coagulations, wherein ſome Parts of the Fluid thus changed is rendred thicker, and others thinner than before: And a Fluid thus circumſtanced is ſaid to be *unequally* fluid, (a Term much uſed by our Author, both with Relation to the Blood and nervous Juice) that is, having ſome Parts apt to adhere in its Paſſage, and cauſe Obſtructions in the finer Veſſels, by their Groſneſs and Tenacity, while others are more ſuſceptible of Motion, and flow through minuter Canals than before.

But further, in ſome nice Circumſtances we are taught to make a Difference between this *Lentor* and *Viſcidity*; that is, when the coagulated Part of the Blood, which ordinarily goes under both theſe Appellations, is rendred by Heat, or any other ſufficient Cauſe, ſo deſtitute of Humidity, that it will not recede from its Figure upon any Impulſes made againſt it in the common Courſe of Circulation, and animal Action; whereas while it remains under that Property which gives it *Viſcidity*, it hath yet ſo much Share of Humidity, and is ſo lax in its Cohæſions, as to admit of a Recedure from any Figure into another, on any ordinary *Impetus* againſt it: ſo that every *Viſcidity* may be deemed a *Lentor* in the Blood, although every *Lentor* is not *viſcid*; and the Difference herein may eaſily enough be conceived by what obviouſly occurs when any adhæſive, or ſuch like moiſt Subſtance, is by Heat dried into a more tough Nature, until it arrives even to a Degree of Friability. Yet although our Author in ſome Places uſes the Term *Lentor* in this Senſe, where *Viſcidity* does not ſo well expreſs the Thing intended, yet for the moſt Part it is to be underſtood only of ſome Part of the Blood made thicker than natural, and by no Means reaching to Conſiſtence or Hardneſs, as may be ſeen particularly in Page 248.

Another Circumſtance of this *Lentor*, on which our Author lays conſiderable Streſs in ſome Places, ought thoroughly to be underſtood, and that is, when it is waſhed out of the capillary Arteries into the Veins, under a certain Degree of Viſcidity, that ſhall in a ſmall Quantity be not ſo eaſily propelled forward with the Current, as a *Lentor* otherwiſe circumſtanced ſhall in a much greater Quantity; which therefore may be here thus further explained.

Suppoſe then a Particle of *Lentor*, to be propelled by the circulating Current towards the Heart through any Vein whatſoever; but that this *Lentor* is ſo firm in Conſiſtence, that the *Impetus* made upon it will not change its Figure, it is then manifeſt the Impulſe of every circulating Particle of Blood againſt it from behind, will ſtrike it forward, or accelerate its Motion; and that much faſter than when its Conſiſtence will admit of a Recedure from its Figure upon ſuch Impulſe, becauſe in Proportion to ſuch Recedure will that Impulſe be loſt; and the more eſpecially where a certain Degree of Adhæſion or Tenacity is alſo the inſeparable Conſequence of ſuch a Conſiſtence. For by the known Laws of Circulation, the groſſer or thicker Particles (ſuppoſing them alſo ſpecifically lighteſt, which is the Caſe here) will be thrown toward the Sides of the Canal, by a greater Velocity at the middle of the Stream, and conſequently will the Particle of *Lentor* be oftener ſtruck upon on that Side towards the Axis of the Veſſel than on the other, and that too with a greater Force; wherefore then a Particle thus circumſtanced in its Conſiſtence, as this is ſuppoſed to be, that will admit of a Change of Figure on the leaſt Impulſe, happens thus to float, it will be quickly ſtruck out into a longer Form; and the more ſo too, becauſe that Part next the Side of the Veſſel will meet with ſome Retardation on every Contact therewith. And thus a *Lentor* comes to be ſpread along the Coats of the Veſſels, as *Bellini* expreſſes, like a *fine Web*, *Pag.* 196, and 200.

This alſo explains to us the 193, and 194 Pages, where it is accounted for, why a leſſer Quantity of *Lentor* in ſome Circumſtances ſhould be longer in its Courſe through the Veins than a much greater Quantity, under different Modifications; as the Reaſons here muſt be manifeſt to every one of ordinary Attention,

tention, why a viſcid pliable Particle will not be carried ſo faſt along the Current, as one that is rigid and hard. And this alſo plainly accounts for that great Retardation of Motion in the *Lentor*, as it returns through the Veins, which is frequently made Mention of; and particularly in the XIX *Propoſition.*

Hereby likewiſe the Reader will eaſily perceive the Difference between breaking the *Lentor* in its *tranſverſe* and *longitudinal* Contacts, and the different Powers by which they are effected; and clearly diſcern the ſeveral Means, frequently enumerated by our Author, either of leſſening or increaſing the Blood's Viſcidity, and of obſtructing, or opening again the capillary Veſſels. For ſuppoſe a Particle conſiſting of yet minuter Particles, cohering in thoſe Surfaces on all Sides which are at Contact; it is plain that every Impulſe from the propelling Current will rather ſtrike them into cloſer Contact, as to their tranſverſe Surfaces, (unleſs in ſuch a Circumſtance of Conſiſtence as before mentioned, where the Inequallity of Impulſe, greater towards the Axis than the Side of the Canal, ſtretches it out into a Film or Web) and give the *Lentor* a greater Reſiſtance to Separation, or a more tenacious Conſiſtence; but an Impulſe upon it from the Side of the Canal, in that Contraction which it has frequently and ſtrongly while in the Arteries, divides thoſe tranſverſe Contacts, and facilitates their Separation from one another, in that Agitation as is made by a Compoſition of both theſe motive Powers.

Thus we come to underſtand how a leſs Quantity of a viſcid *Lentor* ſhall be longer in ſhaking away from the Membranes to which it adheres, than a greater Quantity of a *Lentor* that is not ſo cohæſive or viſcid in it ſelf; and this chiefly for two Reaſons, firſt, becauſe the Contraction of the Veſſel cannot make ſuch a Separation of its tranſverſe Surfaces, as to deſtroy or weaken that *Niſus* they have to mutual Contact; and ſecondly, becauſe the preterfluent Current hath not ſo much Surface to ſtrike againſt, when ſuch Contraction thruſts it within its Reach, as will facilitate its Impulſe in dividing it laterally, or by ſuch a rotary Motion as is mentioned *Page* 200.

But what is of greateſt Moment is hereby rendred plain, and that is, how it comes to paſs that *Compreſſion* may increaſe a *Lentor*, the Obſtruction of an Artery, Entanglement of Heat, and a Perception of Cold; and likewiſe have Effects reverſe to the whole; which Term is frequently made Uſe of for both; for it is hereby manifeſt, that in the firſt Acceptation is meant ſuch Compreſſion as ariſes from the Protruſion *à tergo* of the circulating Stream, which in a viſcid Blood, and beginning Obſtructions, will aggravate all the Symptoms of a *cold* Fit, by accumulating the Viſcidity in the Capillaries, and incloſing the igneous Particles; but when ſuch a Compreſſion from a Protruſion of the Current internally, hath thruſt out the Arteries to a Stretch wherein the *Niſus* of their Springs, or Endeavour of Reſtitution, exceeds the propelling Power, then will their Contractions, or Endeavours of Reſtitution, as in all elaſtick Bodies in the ſame Circumſtance, re-act upon the accumulating Matter with ſuch Force, as is ſufficient to ſhake it away, to divide its Cohæſions, to let out the igneous Particles, and bring on all the oppoſite Appearances, which are the Affections of an *hot* Fit. When therefore the Terms *Preſſure* or *Compreſſion* are uſed in the former Senſe, it is to be underſtood *that* from the circulating Stream; and when in the latter Senſe, *that* from the Contraction of the Veſſels. For although the Term is for both in many Places preſerved the ſame, yet under theſe different Circumſtances it hath contrary Effects.

And thus it comes in the cleareſt Manner intelligible, how that increaſed Contraction of the Arteries, ſo frequently mentioned in the XIX *Propoſition*, and about the Beginning eſpecially, ſhifts the Contacts of the incloſed *Lentor*, and in Concurrence with the direct Motion of the Current produces an Agitation, compounded of direct and tranſverſe Impulſes, which is by Degrees ſufficient to break away the Obſtruction, and in many Circumſtances of Conſiſtence and Cohæſion of the *Lentor*, to digeſt it into the State of natural Blood, or fit for Expulſion by Perſpiration, or ſome other Outlet.

In the XIX *Propoſition*, and ſome other Places, mention is made of a *Lentor* that is ſo dry, as to abſorb from the Arteries ſo much Humidity, as deſtroys their Elaſticity; which comes to the ſame, if the Reader underſtands ſuch Dryneſs from the ſame common Cauſe, as gave the like Property to the *Lentor* it ſelf; although it is not difficult to conceive how a very dry Matter adhering to their Coats ſhould, as a *Stimulus* alſo to their more frequent and ſtrong Contractions, occaſion a greater Conſumption of Humidity than is conſiſtent with a Continuance of their Elaſticity.

The Reader will moreover frequently obſerve ſuch Terms as dry, watery, *&c.* applied by our Author to the nervous Fluid; and which therefore we think neceſſary to take Notice of to ſuch as are not accuſtomed thereunto, as ſignifying no more than that the nervous Fluid may, as all others of the ſame Denomination, be made up of Particles more or leſs endewed with the Properties eſſential to Fluidity; and which will not be difficult to thoſe who attend but to the obvious Qualities of ſuch Bodies; for all Fluids whatſoever are made up of Particles in themſelves as really ſolid, in Proportion to the Matter they contain, as thoſe compounded of the moſt hard and conſtituent Bodies; but that a Collection of them makes a Fluid, is owing to their particular Figures, and Facility of Motion over one another; and in Proportion to the Aptitude of their Figures for Motion, and their Parts of Cohæſion, is a Collection of them more or leſs fluid: And as Humidity alſo is a Property reſulting much from the ſame Mechanical Affections, which fits the conſtituent Particles to inſinuate into, and adhere with any other Bodies, wherewith they come into Contact; ſo any fluid Body may be ſaid to be more or leſs moiſt, or ſaid to be more watery or more dry, as its compounding Parts are more or leſs endewed with ſuch Properties.

Common Experience informs alſo, that a Collection of Particles may put on the Appearance of Fluidity, and anſwer in moſt Things to a fluid Body, which ſhall very little, or not at all, have the Quality of Humidity; Thus fine Sand, powdered Alabaſter, and Quickſilver, are in many Reſpects Fluids, and yet have not one jot of Humidity, that is, have not the Property of wetting, or adhering to any Bodies, wherewith they come into Contact. As therefore the animal Fluids, and even the nervous Juice, which ſometimes alſo goes under the Denomination of Spirits, are in ſome Meaſure compounds of different Particles, although all of them collectively conſtituting a Fluid, ſome of which Particles may be more fitted both for Fluidity and Moiſture, and others for Fluidity only without the other Quality; according therefore to the different Proportions of theſe in the whole, will the compounded Juice be properly ſaid to be more or leſs fluid, as alſo more or leſs dry. And as Water is the Standard of greateſt Humidity, ſo any Fluid is ſaid to be more or leſs watery, according to its greater or leſſer Participation of the ſame Properties; and the further it deviates therefrom, by abounding with Particles leſs adhæſive, more ſubtle, or more rigid, will it juſtly be termed comparatively dryer, hotter, or the like.

Thus much is hoped ſufficient to give the Reader a juſt Apprehenſion of theſe Differences in the animal Fluids; and without it there can be but very little Advances made in any true Knowledge of the OEconomy; and the more particularly have we taken Pains to inculcate thus much here, becauſe without it there can be no underſtanding the Writings of *Bellini*, either on the following, or any other Subject: And to a true Acquaintance with theſe Differences, in the compounding Particles of the Fluids, and the contractile Powers of the Veſſels circulating them, may be aſcribed the ſole Foundation of phyſical Knowledge.

The Reader may perhaps find Difficulty in the *cold Ferment* which our Author ſometimes mentions amongſt the Cauſes of immediately running the Blood into a *Lentor*; but this will ceaſe to be ſtrange to any one who conſiders a Procedure of like Nature in many Inſtances; as all Acids, and Mixtures abounding with ſaline Particles, do both immediately give a Perception of Cold, by deadening that Quantity of Motion in the ſenſory Organ, wherein its natural Heat conſiſted, and alſo coagulate every ſofter Fluid with which they are mixed, by curdling the lighter and more yielding Particles into a Grume, which is equivalent to our Author's *Lentor*, and rendering the other Parts thinner than before: And becauſe ſuch Mixtures brought into the Blood, whether from a ſharp cold Air, which is known to abound with a nitrous penetrating Salt, or from Humours ſtagnating in the Glands, and turning therein acid, do give it Motions different from thoſe of a natural State, they are properly enough termed Ferments; and as joined with a Perception of Cold, whether from their immediate Contact, or from their Conſequences in producing a *Coagulum* or *Lentor*, they are alſo ſignificantly called *cold Ferments.*

It is preſumed needleſs to moſt Readers of Works of this Nature, to inform them, that by the Diviſions of Fevers into *Quotidians*, *Tertians*, and *Quartans*, is to be underſtood ſuch as return every Day, every other Day, or every third Day; for *Tertians* and *Quartans*

Quartans are reckoned incluſively; in the former, taking in the two ſick Days, with the well one between; and in the latter, the two ſick Days, and the two well ones between. All other Subdiviſions will from hence be eaſily enough underſtood.

OF

FEVERS.

The ANTECEDENTS, CONCOMITANTS, *and* CONSEQUENCES *of every Fever.*

SINCE it is our Intention here to be ſatisfied what a Fever is, it is neceſſary to enter on ſuch an Inquiry by the ſame Steps as we come to the Underſtanding of any other Diſeaſe; that is, ſince by Phyſical Obſervations it appears what is peculiar to every Fever, what precedes, what accompanies, and what follows its ſeveral Kinds, in a Collection of all theſe together muſt conſiſt the Nature of the Diſeaſe; and all theſe Antecedents, Concomitants, and Conſequences, to every particular Fever, are firſt to be ſet in View; whence the Neceſſity appears of finding out ſome Cauſe of all theſe Appearances, and the Manner of its Exertion; or, which is the ſame Thing, what is the real Nature of a Fever. Becauſe therefore the Enumeration of theſe Feveriſh Attendants has no other Regard, than by them we may be carried on to their reſpective Cauſes, and the Means of their Operation, thoſe very Affections ought diſtinctly to be propoſed, without imagining or reciting any particular Cauſe, ſuch as Putrefaction, Heat, an occult Quality, Poiſon, Fermentation, or any Thing like thereunto; but whatſoever may be their Cauſes, and their Manner of Operation, (all which ſhall be deduced in the ſubſequent Propoſitions) thoſe Affections only are to be conſidered that are eſſential to every Fever, and are obvious to our Senſes, that from thence we may be conducted to thoſe neceſſary Cauſes, of which as yet we are in Doubt, and on Inquiry after. There is therefore no other Method in the Enumeration of theſe Feveriſh Affections neceſſary, but that they be ſeverally recited as they appear in every Inſtance; and Putrefaction, Efferveſcence, with other Cauſes hereafter to be aſſigned, are not only needleſs to be joined to ſuch Relations, but would be altogether foreign to our Purpoſe, and contrary to our Intention, which as yet only ſuppoſes ſome Cauſe, but what that is, leaves to Uncertainty, and future Inquiry.

If then we fix upon any Method in the Recital of theſe Affections, which indeed ſeems very little, if at all, neceſſary, we ſhall not however follow that which depends upon the moſt common and vulgar Diviſion of Fevers, into an *Ephemera*, a *humoral* Fever, and an *Hectick*; becauſe this ſuppoſes their reſpective Cauſes, as in the firſt an Accenſion of the Spirits or Blood, in the ſecond a Putrefaction of Humours, and in the laſt an Accenſion of the ſolid Parts: For we would confine our ſelves under every Diviſion of the Diſeaſe, to ſuggeſt nothing touching its Cauſe, the Knowledge of which is ſought, as of a Thing yet altogether unknown, by an Acquaintance with thoſe Affections of every Fever that occur to our Senſes. But as it is our Deſire to obſerve ſome Order in the following Searches, we ſhall confine the Enumeration of febrile Affections to two Diſtinctions only, which are obvious to the Senſes, and are ſo far from any Suppoſition of a Cauſe, that they ſuggeſt not the leaſt Hint that Way, and yet include an eaſie Diviſion of all Fevers, ſo that there cannot happen any particular Caſe which is not reducible to one of thoſe Heads: And theſe two Diſtinctions, obvious to the Senſes, and ſuppoſing no particular Cauſe, and to which all Fevers are reducible, reſpect only the Times of a Fever's Duration; for no one Fever can be met with, that does not at ſome Time or other totally terminate, or break into Intermiſſions and Returns; that is, there is no Fever but is either *continued* or *intermittent*; and theſe are two Diviſions that are manifeſt to the Senſes, and ſuppoſe no particular Cauſe, and yet include all the Kinds of Fevers that can poſſibly happen.

All Fevers either Continuents *or* Intermittents.

Let then a *Continued* and an *Intermittent* be the general Diviſion, under which all particular Fevers are to be reduced; (for we cannot begin with the Definition of a Fever, becauſe as yet we are ſuppoſed not to know what it is) and by a *Continuent* we underſtand that which never leaves the Patient through the whole Time of his being ſick, or of which there is no diſtinct Termination within that Space, or no Intermiſſion; (for all theſe are uſed by *Celſus*, *Lib.* 3. *C.* 5. to expreſs the Time of the Fits Seceſſion) but an *Intermittent* is that which within the Space wherein a Perſon is ſaid to be ill, does for ſome Time leave the Patient free of it, or of which for ſome Time there is an entire Termination, or in which it altogether diſappears.

What a Continuent.

What an Intermittent.

Becauſe therefore a *continued* Fever is that which never totally goes off during its whole Courſe, or that wherein the original and permanent Cauſe is totally exhauſted by one ſimple Paroxyſm; or ſo remains, that after one Circuit, it is ſtill able to renew others before the preceding quite are off, either after a certain Interval of Time, or an uncertain one: If after one ſimple Paroxyiſm the whole original and permanent Cauſe is totally removed, and diſappears, and upon a Removal of ſuch a Cauſe the Fever ceaſes ſo as not at all to return again; this paſſes for a Fever of one ſimple Circuit, called a *Simple Continuent:* But if in this one Circuit the original Cauſe ſtill remains, ſo as to excite other Fits or Exacerbations, before the preceding are quite off, and at ſtated or certain Periods of Time, it then becomes a Fever of many Circuits, and may be called a *Periodical Continuent:* But if its Exacerbations are not in any certain Quantity of Time, but return ſooner or later, but yet before the preceding is quite off, it is a *Wandering* or an *Erratick Continuent:* But if the original and permanent Cauſe continues to excite new Paroxyſms ſome Time after the preceding are quite off, an *Intermittent* is produced; and that a *periodical* one, if its Returns are at ſtated Times; but a *Wandering* or an *Erratick Intermit-*

A Simple Continuent.

A Periodical Continuent.

An Erratick Continuent.

A Periodical Intermittent.

An Erratick Intermittent.

tent, if thoſe Returns are not at certain Periods, but happen ſooner or later, before or after the Time expected. This therefore is all the Diviſion of Fevers that our preſent Purpoſe requires, and this their Subdiviſions; that is, every Fever is either *continued* or *intermitting*, and the *continued* is either *ſimple*, or *periodical*, or *erratick*; but the *intermitting*, only *periodical* or *erratick*: And from a Recital of the different Kinds of Fevers, it will immediately appear how they all come under this eaſie, perſpicuous, and neceſſary Diſtinction.

What Fevers belong to Continuents.

For Inſtance: A *Legitimate Ephemera*, that finiſhes its Circuit in 24 Hours, or thereabouts, and goes off ſo as to leave no Cauſe of Return, is a *Simple Continuent*; an *Ephemera* of many Days is indeed longer, but then it is only one Circuit protracted thro' ſo much Time. An *imputrid Synochus*, (for here we are forced to uſe Terms for Want of better, which ſuppoſe Putrefaction as a Cauſe) or a *Simple Synochus*, or what is alſo called *Febris Inflativa*, is only one *Simple Continuent*, when it goes off ſo as not to return again. A *Putrid Synochus*, or *Febris continens*, differs from the foregoing in a greater Heat, and an Intenſion of all the Symptoms, but after one Circuit, the Patient quite recovers. A *Cauſus*, or a *burning Fever*, when it has no Periods, that is, without Return, differs from the two preceeding only in a yet more intenſe Heat, and extreme Thirſt: And at laſt of all even a *Hectick* is of the ſame Claſs, when it is of one Courſe only, with equal Affections of Pulſe, Heat, *&c.* unleſs when aggravated by Meals.

But to *Continuents* regularly recurring a *continued Tertian* is to be reckoned, ſince this conſiſts of many Circuits, every one of which returns exactly on the third Day, before the preceding is quite off; and to this *continued Tertian* is reducible alſo the aforementioned *Cauſus*, ſince it has the ſame Types or Periods as a *Tertian*: And to this Head belongs the *Aſſodes* and *Elodes*, for the ſame Cauſes. A *continued Quotidian*, ſince this in like Manner conſiſts of many Exacerbations, returning every Day at the ſame Time before the preceding quite ceaſes; and to this *continued Quotidian* ſome reduce, for the certain Coldneſs that attends it, an *Epiala*, the leſſer *Syncopale*, and the *humoral* or *plethorick Syncopale*. A *continued Quartan*, ſince this alſo conſiſts of many Circuits, which return every fourth Day at certain Times, before the preceding is quite off: And laſtly, *malignant* and *peſtilential Fevers* are for the moſt Part *Continuents*, with regular Exacerbations, altho' ſometimes too they happen to be *Simple Continuents*, ſo as to be reducible to both Claſſes, and even ſometimes they are likewiſe of the *Erratick* Kind, as we ſhall have Occaſion to obſerve hereafter: But all theſe Fevers are called *eſſential* or *primary Continuents*, or *ſecondary* Fevers, which are accidental or ſymptomatick; and ſome are likewiſe termed *Concomitant*. The *Primary* are in themſelves a Diſeaſe, and come not after any other Diſeaſe whereby they ſubſiſt: The *Symptomatical* ſubſiſt by another Diſeaſe from which they have their Origin: And the *Concomitant* Fever hath ſome other Diſeaſe joined with it, from whence it was neceſſarily produced, or with which it hath ſome common Cauſe. All theſe are alledged to be *Continuents*, (tho' I cannot ſee why they may not alſo be *Intermittents*, if they reſult from a Cauſe that periodically ſubſiſts) and to theſe are joined a *Phlegmonodes*, an *Eryſipelatodes*, a *Typhodes*, a *Lypiria*, a *Lenta*, and the *Small-Pox* and *Meaſles* in Children.

Primary, and ſecondary Fevers.

Intermittents, their Sorts.

To theſe ſucceed *Periodical Intermittents*, of whoſe Number is the *Intermitting Tertian*, conſiſting of many Paroxyſms, every one of which returns every third Day at a certain Time, after the preceding hath been quite off: An *Intermitting Quotidian*, keeping to the ſame Regularity of Return every Day, after the preceding Fit had been off for ſome Time: And an *Intermitting Quartan*,

tan, orderly returning every fourth Day, ſome Time after the foregoing Paroxyſm was quite gone.

Legitimate, and ſpurious Fevers.

Both *continued* and *intermitting* Fevers are either *legitimate*, *entire* and *true*, or *ſpurious*, and of the *baſtard* kind; to the former belong all Affections, and no other, but what are proper to ſome Kind of Fever; but to the latter only ſome of thoſe neceſſary Affections, joined with what concerns alſo other Diſeaſes. But we ſhall not here diſtinctly conſider the *ſpurious* Kinds amongſt thoſe Affections that properly belong to Fevers, nor mention them in the following Propoſitions, becauſe they will be eaſily underſtood from a right Knowledge of the *genuine* Fevers. Yet from hence it may by the Way be obſerved, that no *ſpurious* Fevers, which can be reduced to any certain *Genus*, will be omitted under ſome or other of the following Diviſions.

Furthermore, ſometimes both *ſimple* and *periodical* Continuents, as well as *Intermittents*, are confounded with one another; that is, more Fevers of the ſame or of different Kinds may afflict a Perſon at the ſame Time: As more *Simple Continuents* than one; more *periodical Continuents*; more *Intermittents*, either *periodical* or *erratick*; or *Simple Continuents* and *Intermittents* confuſed, may begin and terminate ſo near the ſame Time, as to be ſcarcely diſcerned.

Alſo both ſhall keep its proper Affections, and neither prevail; or one ſhall change the other into its own Kind, or communicate to that ſomewhat of its own Nature; And by this they are diſtinguiſhed from *ſpurious* Fevers, which participate of the Nature of many together, and take their Denomination from that which prevails, as a Mixture does from that Element which is moſt conſpicuous in its Compoſition.

Compounded Fevers.

Fevers are ſaid to be *compounded*, when there ſubſiſts more than one at a Time; and they are evidently diſtinguiſhed into ſuch as are compounded of one Sort only, which take their Denomination from the Numbers concerned, two, three, *&c.* or *double*, *triple*, &c. *Tertian*, *Quartan*, or *Quotidian*; but when they are compounded of different Kinds, they are deſtitute of any proper Appellation, except that which is compounded of an *intermitting Tertian*, and a *continued Quotidian*, which is wont to be called a *ſemi-tertian*, or a *Febris Horrida.* When theſe Fevers are ſo compounded that one goes off as another comes on, they are called *Subintrant*; when one comes quickly after another is quite gone, *Coaltern*; but where one immediately takes Place after the Diſappearance of a preceding by *Avicen*, it is called *Communicant.*

We ſhall not therefore hereafter, in the Enumeration of different Fevers, or in our Propoſitions, diſtinctly treat of thoſe which are compounded; for whatſoever in them requires Demonſtration, will be altogether found under thoſe Fevers of which they are compounded: Only ſomewhat concerning a *ſemi-tertian* ought to be ſaid, becauſe there are in that what ought not to be omitted; and here alſo by the Way it may be obſerved, that in compound Fevers there cannot be conſtituted any particular *Genus*, which will not be touched upon in the propoſed Method.

Malignant and peſtilential Fevers.

Laſtly, It appears from their very Appellation, that *Wandering* or *Erratick* Fevers may be both *Continuents* and *Intermittents*; and for the ſame Reaſon alſo *Malignant* and *Peſtilential*, which keep to no Certainty of Acceſs, Termination, or Circuit, to no certain Form of a Fever, but repeat their Exacerbations ſooner or later, oftener or ſeldomer, or for longer or ſhorter Times; and ending ſometimes hot, and at others cold, with many Irregularities of like Nature, not reducible to any Standard; yet neither in theſe is there any Thing of Moment ſhall be omitted, and even the *Erratick* will be eaſily cognizable under ſome particular Diviſions.

Becauſe therefore the Species of Fevers which we have reduced to *Continuents* and *Intermittents*, is ſuppoſed as much as is given to a skilful Phyſician to be acquainted with; and that their ſubordinate Diviſions are in Conformity to thoſe Affections which our Senſes diſcover, nothing being ſuggeſted about their Cauſes, or Manner of Exertion: This Method ſeems moſt requiſite, that in their proper Order may be recited the *Antecedents*, *Concomitants*, and *Conſequences* of every particular Fever, about whoſe Origin and Nature we would be informed; it now behoves us therefore to follow ſuch a Method, which the preceding Diviſion leads us into, and conſequently in the firſt Place to explain the Affections of *ſimple Continuents*, then *periodical Continuents*, thirdly, *periodical Intermittents*, and laſtly, *continued* and *intermitting Erraticks*; and what theſe ſingly are to inveſtigate under ſeveral Propoſitions. Proceed then to the Work it ſelf.

The ANTECEDENTS, CONCOMITANTS, *and* CONSEQUENCES *of ſimple continued Fevers.*

Of a Legitimate Ephemera, by the Greeks *called* πυρετὸς ἐφήμερος.

ANTECEDENTS. Sadneſs, Fear, Anxiety, Anger, Watching, Trouble of Mind, Evacuation, Exerciſe, any Exceſs, Pain, Hunger, Thirſt, hot Meats and Liquors, Drunkenneſs, Crudity whether from too much or too little Heat, Heat of Weather, much ſitting by the Fire, or in the Sun, or in hot Baths, a diminiſhed Perſpiration, Things too cold, or too aſtringent, as alluminous Baths, and the like: Inflammations of the Glands, or Bubo's, eſpecially when they ſupporate, a hot and dry Conſtitution, too much Sleep, a Retention of Vapours, Stools, and Urine; Inflammation of the extreme Parts, and a Plethora.

CONCOMITANTS. The Beginning from ſome procatartick Cauſe, that is evident, manifeſt, and immediately raiſing the Fever, by a Diminution, for Inſtance, of Perſpiration, *&c.* the Urine at firſt in Subſtance, Colour, and Contents, near to that of well Perſons, ſometimes crude and whitiſh, afterwards a good Sediment, or a Cloud, Reſpiration great and frequent, Heat and Pain of the Head, the

Pulſe not much differing from a natural one, only ſometimes greater, ſwifter, and more frequent, ſometimes alſo weaker, but always without any Inequality; and when the Fever ceaſes, ſoon coming again to its natural State, without any Return of Diſorder, as it often happens in other Fevers; the Heat ſometimes greater than natural, and more troubleſome, but moderate and eaſily ſupportable even in the Heat of the Fit; its Acceſſion without Cold, Rigor, Horror, Yawnings, Stretching, or ſometimes with a ſlight and ſhort Horror; an eaſie and equable Increaſe of the Heat and the Pulſe: Its Declination, by *Celſus* called *Seceſſion*, is with a Moiſture and humid Vapour, like the Sweat of well Perſons; after which there will be a total Ceſſation of the Fever, or, as the ſame Author has called it, a perfect Termination, with an Increaſe of Colour in the Urine. From Anger, ariſes a Pulſe that is high, quick, and ſtrong, and the Heat is not acute, but diffuſed and moderate. From Grief, the Pulſe is low, ſluggiſh, languid and ſlow, and the Heat is intenſe rather than diffuſed, the Body emaciated, the Eyes hollow, and a total Change in the Complexion. Like to this is that from Diſquietude of Mind, but with a leſſer Degree of Waſte, and ſinking of the Eyes, and Diſcompoſure of Countenance. From Watching, the

Face is moiſter, the Motion of the Eyes more heavy, a more difficult raiſing the Eye-Lids, and on thoſe alſo will their riſe ſome Moiſture. If the Patient hath been wearied with too much Labour, the Skin is drier till the Height of the Fit, but after that, in thoſe who have not been over-wearied, a tranſpirable Moiſture riſes from the very inmoſt Parts, and covers the whole Surface with a Dew; but in thoſe who have been extremely exerciſed, a Dryneſs remains upon the Skin, even to the Declenſion of the Fever. From Adſtriction, the Skin is harder, more compact, and the Heat moderate to the Touch; but in the Progreſs of the Diſtemper, the Heat grows more intenſe, the Urine higher coloured, without any Hollowneſs of the Eyes, or Extenuation of the Body. From Buboes, the Pulſe is high, ſwift, frequent, equal; the Heat great, but tolerable, and a Redneſs of the Face. From a *Plethora*, there is yet a higher Colour in the Face and Eyes, the Urine is redder, the Pulſe great and ſwift, and the Fit laſts 24 Hours, more or leſs.

CONSEQUENCES. A *Simple Synochus*, or a *Synochus continens*, or an *Hectick*; eſpecially in the young hotter Conſtitutions in the Spring-Time, and of a foul Habit: But what Fevers are ſubſequent to this, their particular Affections will diſcover, and they will be alſo foreknown by the particular Symptoms of the Patient before the *Ephemera* it ſelf is quite off; and ſome of thoſe Fevers already enumerated will ariſe after an *Ephemera*, if after 24 Hours there yet continues a Pain in the Head, and that continues for as long Time further without any Appearance of Sweat.

An Ephemera *of many Days.*

ANTECEDENTS. The ſame as in an *Ephemera* properly ſo called, but more aggravated; Obſtruction of the Skin, Repletion, Debauches, Catarrhs, Buboes.

CONCOMITANTS. In like Manner the ſame, but their Continuance for many Days without Intenſion or Remiſſion.

CONSEQUENCES. Likewiſe the ſame in all Reſpects.

A Simple Synochus, *or that Fever called* Inflativa.

ANTECEDENTS. The ſame as in an *Ephemera*, but eſpecially a diminiſhed Perſpiration, and chiefly of hot Steams, a Fulneſs of the Blood-Veſſels, or a *Plethora ad Vaſa*, with a Hardneſs of the Fleſh, the Spring Seaſon, Youth, too plentiful a Uſe of Wine, Meats over-nouriſhing, a Suppreſſion of the *Hemorrhoids*, *Menſes*, or any other Flux, which Nature either requires, or is accuſtomed to.

CONCOMITANTS. The ſame as with an *Ephemera*, but more apparent, and more aggravated; the Heat tolerable, but greater; the Skin not dry, but covered with Moiſture; Urine like to what is natural, but thicker and redder; the Pulſe vehement, ſwift, quick, full, large, and equal; the Face and whole Body red, and as it were inflated; the Veins ſtretched and tumid with Blood; a Wearineſs with Stretching; Heavineſs of the Head; Difficulty and Quickneſs of Reſpiration; Sleep for the moſt Part ſound, but diſturbed with the Appearances of Things red; a beating of the Temples; Straitneſs of the Breaſt; and great Reſtleſneſs. A Duration of all theſe for three, four, or more Days, even to the ſeventh, without Remiſſion; and through that whole Space the Heat is equable, or of the ſame Height, and the Fever is called *Homotonos*, or *Acmaſtica*; or it continually encreaſes, and is called *Epacmaſtica*; or it continually decreaſes, and is called *Paracmaſtica*. It is terminated either by Sweat, or by a *Hemorrhage* at the Noſe.

CONSEQUENCES. As to Fevers, the ſame as after an *Ephemera*, and with great Fulneſs, which, if not leſſened by medicinal Helps, ends in a Phrenzy, a

Pleuriſie, or ſomewhat of the like Nature, that is cauſed by too much Blood.

A Putrid Synochus, *or a* Febris continens.

ANTECEDENTS. An Obſtruction of the Skin, Liver, and other internal Parts, from groſs and viſcid Humours; too great a Quantity of Blood; Youth; Spring; a Suppreſſion of natural, or accuſtomed Evacuation; a bilious, or a ſanguine Conſtitution; much Labour and Exerciſe; much vexing Cares; a long Summer's Heat; and a long Uſe of Diet or Medicines, that are hot, drying, and apt to encreaſe Choler.

CONCOMITANTS. The Acceſſion without Cold, Horror, and Shivering; the Heat conſiderable to the Touch, but leſs troubleſome and burning than in periodick Fevers, but greater and more enflamed than in the *Simple Continuents* already explained; in its Progreſs from the firſt Acceſſion to its final Termination, it either decreaſes in a certain Proportion, or continually decreaſes, or continues at the ſame Height, and the Courſe of the firſt Day generally ſhews which of theſe Ways it will take: That which keeps up to the ſame Degree of Heat is called *Homotonos*, or *Acmaſtica*; or decreaſing, as in a *Simple*

Synochus, Paracmaſtica; or continually encreaſing, *Anabatica*, or *Epacmaſtica*; no new Acceſſion or Exacerbation; the Pulſe great, vehement, ſwift, frequent, unequal and irregular; the Urine thick, turbid, without Sediment, and crude or ſlightly digeſted at firſt; ſometimes alſo a Pain in the Head; Inquietude; Watching; Thirſt; the Urine thinner; ſometimes a Difficulty of Breathing; Inflation, and Swelling of the Belly; black Puſtules, or livid: the *genuine* laſt ſeven Days, the *ſpurious* fourteen.

CONSEQUENCES. If the Urine is red towards the Acceſſion, it generally ends in Recovery, and that ſoon; but where it is whitiſh, for the moſt Part in Death. If it be a long Time protracted, it often brings on an Aſthma, or *Cauſus*, Inflammation of the Lungs, Hemorrhages, a Running or Tickling at the Noſe, Flaſhing before the Sight, and a Heavineſs upon the Countenance.

A Cauſus, *or a burning Fever.*

ANTECEDENTS. Whatſoever intenſly dries and heats; a hot and dry Temperament; Youth, or a ripen'd Age; a hot and dry Temperature of Air; the burning Heat of Summer; immoderate Labour; long Watching; Debauches of Wine; Anger; Thirſt, *&c.* And *Hippocrates* ſays, that *a burning Fever after great Pains in the Bowels is fatal.*

CONCOMITANTS. A burning Heat, conſtant and perpetual, without any Exacerbations, and an inextinguiſhable Thirſt, although the Patient drinks never ſo much; which two are the chief and conſtituent Symptoms, and both of them more intenſe in a *genuine Cauſus*, than in a *ſpurious* one; the Tongue dry, hard, and black; Griping of the Belly; black Stools; Reſtleſneſs; a quick and difficult Reſpiration, with a loud Breathing though the Mouth open; Toſſing about in Bed; a hard and very ſwift Pulſe; and a Flame-coloured Urine. The *genuine Cauſus* goes off about the ſeventh Day for the moſt Part, but the *ſpurious* not till the ninth, eleventh, or fourteenth Day; and they terminate with a Looſneſs, Sweats, Vomiting, Abceſces, or the like.

CONSEQUENCES. Death moſt commonly in People of an advanced Age; as alſo thoſe who are ſeized in the Air, the Temperature, Time of the Year, and other Circumſtances abounding with Cold; an *intermitting Quartan*, eſpecially after the Autumn Fevers.

An

An Hectick.

A hot and dry Conſtitution of the ſolid Parts is called an *Hectick*; and when it waſtes only their dewy Moiſture, it is then ſaid to be an *Hectick* of the firſt Degree; when it waſtes the fleſhy Subſtance and Fat, as *Galen* affirms it to do, of the ſecond Degree; when the Membranes and Fibres, which *Galen* calls *Species Solida*, and others *Gluten*, it is of the third and higheſt Degree. Hence an *Hectick* is of two Kinds, *with a Conſumption*, and *without one*; *without*, when the Moiſture of the Parts is not waſted; but *with one*, when their Humidity is waſted and dryed away; and then it comes to be called an *Hectica Maraſmodes*, and its utmoſt Height is a natural *Maraſmus*, or what the *Latin* Writers call *Marcor*, and it is that very ſame natural Decay of a living Body by Means of Dryneſs, with which all old People die, and is eſſential to the utmoſt Term of Age: From the like Property of Dryneſs does an *Hectick* go on to its moſt fatal Height, which does not kill by Dryneſs and Coldneſs, but by Dryneſs and Heat together. It is called an *Hectick* κατ' ἕξιν, *juxta Habitum*, or habitual; that is, one which is ſo fixed, that it ſubſiſts of its ſelf, and has the Courſe of its Continuance ſubſiſting in the very Parts themſelves, and waſting them, and ſtanding in need of no adventitious Cauſe whereby it may be kept up: Whereas other Fevers are pronounced κατ' σχέσιν, or *Schetica*, that is, in ſome Diſpoſition which requires an Occaſion of Exertion, and a Cauſe without which no Fever would be raiſed.

ANTECEDENTS. Whatſoever can waſte the greateſt Part of theſe Humidities which are in the Solids, or raiſe a great Heat, or both, and a Diſpoſition to receive thoſe Impreſſions; thus conſtant and large Evacuations by Stool, Urine, or Sweat, Ulcers in the Lungs, Breaſt, Womb, Reins, *&c.* Faſting, Labour, Grief, the Waſte of burning and acute Fevers, as alſo others of long Duration, an hot Conſtitution of Body, and an hot and dry Conſtitution of Weather or Climate, Debauchery, or Madneſs, will bring on this Waſte.

CONCOMITANTS. A Heat ſo much without Pain and Uneaſineſs, that a Perſon perceives not himſelf to be Feveriſh; that at firſt is gentle, but afterwards more intenſe and enflamed, and more ſenſible in the Arteries than any where elſe; its Increaſe after eating, at what Time ſoever it be, and whether every Day obſerved the ſame or not, and a Continuance of its Intenſion all that Time the Chyle is in Diſtribution, and after which the Patient returns to his wonted Temper, and ſo continues till after another Meal; with the Heat, the Pulſe is alſo changed, and becomes higher and quicker during the Intenſion of that; and it alſo returns to its uſual Condition ſome Time after Eating, that is, low and quick. Theſe Changes happen without any Cold, Horror, Shivering, Yawning, and all thoſe Symptoms which are common in the Acceſſion of all other Fevers; and theſe Changes of Heat, and the Pulſe after Eating, are proper only to, and inſeparable from an *Hectick.* At other Times the Pulſe is low, and moderately quick; the Urine of a Colour like to what is natural, with a continual Decreaſe of Strength, Extenuation and Dryneſs of the Body. But when it is come to its ſecond Degree, a yet greater Dryneſs and Debility; the Pulſe more weak, leſs quicker and harder; the Urine oily, with a Sort of Fat ſwimming upon it like a Cobweb. And yet in the third Degree all theſe Symptoms are aggravated, and attended with intenſe Dryneſs. Moreover, ſince in general an *Hectick* is attended with an

Heat, at firſt moderate, but afterwards intended; with Dryneſs, Liſtleſneſs to Exerciſe, and a Difficulty in Motion; this Fever may be ranked with *periodick Ephemera's*, both *continued* and *intermitting*; and it may be known by the eſpecial Symptoms of each, eaſie enough to be diſcerned.

CONSEQUENCES. To the firſt Degree ſucceeds the ſecond, unleſs that is firſt cured; and unleſs the ſecond Degree is cured, (for ſome affirm that the ſecond is curable) that is ſucceeded by a confirmed Conſumption, a *Maraſmus*, and inevitable Death.

The ANTECEDENTS, CONCOMITANTS, *and* CONSEQUENCES *of* continued Periodick *Fevers.*

A *Synochus*, or a *continued Periodick* Fever, is of ſuch a Nature, that it never comes to an entire Termination, or to a total Ceſſation of the Fever, before a new Exacerbation; and it takes various Names, as thoſe Exacerbations return ſooner or later, in two, three, or four Days: But there is no Horror, Shaking, or Cold, precedes its Fits, nor do they terminate with Sweats.

A Periodick Tertian.

Antecedents. All thoſe Things which diſpoſe to a more intenſe Heat, a Redundance of Bile ; a hot and dry Conſtitution, whether of any particular Part, or of the whole Body; Youth; hot and dry Diet; Faſting; too ſparing Nouriſhment; frequent and violent Exerciſe; Heat of the Air, or Climate, whether from the Seaſon of the Year, Sun, Bath, *&c.* Suppreſſion of bilious Evacuations; too much Watching; Trouble of Mind; and the like.

Concomitants. Burning Heat, and Thirſt; Watching, or little Sleep; frightful Dreams; Deliria; Bitterneſs in the Mouth; a dry and black Tongue: The Exacerbations without any preceding Cold, Shivering, *&c.* the Seceſſions without Sweat; the Pulſe in the Acceſſion, depreſſed, contracted, and as it were loſt, ſmall, quick and unequal, ſo that one Pulſe is higher than another, and then ſwift and quick; the Urine fiery, red, ſharp, and in the Beginning crude without Sediment; Nauſeouſneſs, bilious Vomitings and Stools, and great Reſtleſneſs, with Uneaſineſs of Mind.

CONSEQUENCES. Principally an *intermitting Quartan*, eſpecially if the *Periodick Tertian* continues till Autumn.

Cauſus, what. A *Cauſus* alſo belongs to a *continued periodick Tertian*, ſince it obſerves the ſame Types, and keeps up to as great a Heat; but of this we have already ſpoke: Alſo a *Colliquant*, or *Colliquative* Fever, which is attended with the utmoſt Heat, that runs into Fuſion the Fat, Fleſh, and Subſtance of the ſolid Parts, exhaling them thro' the Skin in inſenſible Vapour, or expelling them by Sweat, Urine, or Stool; and herefrom happens a ſudden Emaciation of the whole Body, and a Conſumption, hollow Eyes, fallen Temples, a ſharp Noſe, Stools that are greaſy, fetid, ſlimy, cholerick and frothy; the Urine alſo greaſy like Oil: Under this Claſs comes likewiſe the *Aſſodes*, wherein there is a continual Toſſing about, and grievous Reſtleſneſs, for the moſt Part a Nauſeouſneſs at Stomach, and Vomiting, a gnawing Irritation at the upper Orifice of the Stomach, and its Membranes: And laſt of all the *Elodes*, which is continually attended with profuſe Sweats.

A Colliquative Fever.

Aſſodes, and Elodes, what.

A continued Periodick Quotidian, called Latica, *becauſe it is attended with an inward latent Heat.*

Antecedents. Age; a moiſt Conſtitution; Infancy, Sucking Children, and ſuch as have not yet bred their Teeth; old Perſons of a corpulent Habit, and given much to Inactivity; Intemperance, and much Sleeping; damp Countries and Climates, and like Seaſons.

Concomitants. The Heat at firſt Touch ſeems moderate, then intenſely perſevering from one to another Acceſſion, and this chiefly about Evening, without any Cold, Shivering, *&c.* and its Decreaſe without Sweat; the Pulſe ſlower, more unequal, and lower than in other Periodick Fevers; and in the Acceſſions yet more low and ſluggiſh, and ſo depreſſed, as to appear almoſt quite loſt. The Urine in the Beginning of a Fit is crude, then thicker, and leſs fiery and red than in other *Periodicks*; the Thirſt is alſo leſs, unleſs the Patient abounds with Salt Juices; the Countenance a little bloated, flaccid, and wan; Dozineſs; Inappetency; phlegmy Excretions; and it laſts long, ſo as not to terminate ſeldom ſooner than 40 or 60 Days, and ſometimes it continues longer.

CONSEQUENCES. This Caſe is terminated by Sweats, Stools, or Abceſces, as alſo by the Parotide Glands; and is often followed by a *Cachexy*, *Dropſy*, or an *Hectick.*

An Epiala, what.

To this Fever belongs the *Epiala*, either ἀπὸ τοῦ ἠπίου, becauſe it is ſlow and gentle; or from its Rigors, by the *Atticks* called ἠπίαλος, and under that Appellation in *Galen*, wherein every Part of the Body is affected with Heat and Cold at the ſame Time; but not as it is taken by *Avicen*, and the *Arabians*, according to whom, through the whole Courſe of the Fever, the inner Parts are cold, while the exterior are hot. Some reduce this to the Claſs of *Intermittents*; others to *continued Periodicks*; and others to *ſymptomatick* Fevers: And they ſay that it ought to be ranked with a *Periodick Quotidian*, becauſe of the Cold which attends it, and muſt proceed from Phlegm which does not yet putrifie; and becauſe of its Heat alſo, which is in like Manner from Phlegm in a State of Putrefaction; which Heat and Cold both ſubſiſting in this Diſeaſe is witneſſed by the Senſe of Feeling. Hence likewiſe the ſame Perſons affirm, that the Origin of this Diſeaſe is in a putrid Phlegm, or

a

a Phlegm juſt paſſing into a State of Putrefaction.

Hereunto alſo is reduced the *Syncopalis*, which is of two Kinds, though both belonging to the putrid ſort; the one *humoral*, or *repletive*, attended with a Redundance of crude and phlegmy Juices, with a Sinking at the Stomach, ſo that the Patient falls into *Syncope's*, eſpecially on the Fit's Acceſſion, a great Dejection of Spirits, and a little, weak, and unequal Pulſe: The other is a *Syncopalis Minuta*, or the leſſer *Syncopalis*; and this is attended with a thin, ſharp, ichorous Humour, but ſo corrupt and tainted, that it affects the Orifice of the Stomach, and occaſions a *Syncope*.

Syncopalis, either humoral, or

Syncopalis Minuta.

A continued Periodick Quartan.

Antecedents. All thoſe Things which generate viſcid, cold or earthy Juices; a dry, lean Habit of Body; a dusky, obſcure Complexion; a cold and dry Temperament; a declining Age; Autumn; great Irregularity in Living; much Care and Anxiety; a Suppreſſion of the Hemorrhoids, and a tumid Spleen.

Concomitants. Heat, every fourth Day aggravated without any preceding Cold or Quaking, and declining without

out Sweat; in other Reſpects agreeing with an *intermitting Quartan*, unleſs in the Beginning the Pulſe is leſs, ſlower, and more depreſſed, and afterwards more high, full, ſwift, and unequal, than in an *Intermittent*, and more enflamed at the Height; the Heat is more moderate than in a *Periodick Tertian*, and more intenſe than in a *Quotidian*; the Thirſt is middling between that of a *Periodick Tertian* and *Quotidian*.

CONSEQUENCES. An *Intermitting Quartan*, a Cachexy, and a Conſumption.

A Malignant Fever, *and its ſeveral Kinds*, viz. Morbus Hungaricus, Sudor Anglicanus: *A Malignant Fever with Spaſms, a Malignant Catarrh, and Malignant Epidemical Cough, ſee in Phyſical Writers.*

ANTECEDENTS. Vitiated and depraved Humours accumulated in the Body from a bad Diet, ſubject to Corruption; a naturally depraved Conſtitution, eaſily falling into ſuch Circumſtances; and whatſoever is able to corrupt the Juices, and change them into a poiſonous Nature.

Concomitants. A Species of ſome benign Fever, and ſuch a gentle Heat, that at firſt there is no Suſpicion of a worſer Sort; but a little after there is a ſudden Decay of Strength without any manifeſt Cauſe, and a greater Degree of Inquietude and Sweating, than could be expected from ſuch a Fever, and ſuch Heat. The Pulſe is frequent, low, and very weak, ſometimes like a natural one; yet with Inquietude, Anxiety, and all the worſt Attendants, whence ſuch a one is always the worſt; ſometimes at the Beginning of the Fever it is what is called a *Pulſus Formicans*, very ſmall, very quick, and very changeable. The Urine at firſt is like that of well Perſons, although attended with other bad Symptoms, ſometimes thin, crude, without a Sediment; or if any Thing falls to the Bottom, it is more like an Excrement, than a ſettling from the Urine; ſometimes thick, coloured, and turbid, with a thick, red, turbid Sediment. The Heat in Compariſon to that of a *Cauſus* is leſs, although when at the Height in thoſe Fevers, and very burning; but the Symptoms are much more threatning than in a *Febris Ardens*, and the Heat, to what might be expected in ſuch Circumſtances, not ſo intenſe. The Thirſt is ſometimes beyond the Meaſure

ſure of the Heat, and ſometimes none at all when the Fever is very high, with a Dryneſs of the Tongue, and a peculiar ſort of Inappetency, or Loathing of Victuals, ſo that it ſeems ſome nauſeous Medicine; with Vomiting alſo at the Beginning of the Diſeaſe, and frequent Shivering, which ſometimes returns many Times in a Day at great Uncertainties. The Body ſeems very heavy, and the Limbs are quite uſeleſs; Delirium; Pain in the Head, ſhifting from one Place to another, ſometimes in the Forehead, at others in the hinder Part; other Parts likewiſe are troubled with a fixed or a wandering Pain; Sweats frequent, ſmall, and of no Service in the Beginning of the Diſeaſe; the Eyes often happen to look red, and the *Meaſles* and *Small-Pox* to break out, but much more in the Face, Hands, and Feet, than any where elſe; alſo Purple Spots, and thoſe reſembling a Flea-Bite, but theſe appear moſt on the Back and Breaſt, and leſs on the Face, Arms, and Legs, where there are ſometimes none at all. The Face looks ghaſtly, ſtrangely changed from its natural Complexion, and loſes all its vivid Luſtre and Spirit; and ſometimes again comes to its natural Hue, and looks briſk and florid. Dozing, or Watchfulneſs; Loſs of Memory;

ſtrange Appearances; frightful Dreams; Confuſion; Swimming; Tremblings; Convulſions; Inquietude; Anxiety; Dimneſs of Sight; Deafneſs, and Ringing in the Ears; Loſs of Smell and Taſte; Heart Burn, and an unquenchable Thirſt; Nauſeouſneſs; and Worms from the Bowels, through the Mouth and Noſe; looſe and fetid Stools; Diſtillation of Blood from the Noſe, eſpecially at the Beginning of the Diſtemper; Swellings in the Neck, and about the Groin, that are difficult to cure, and which very often turn in again; the Tongue dry, rough, and black; the Mouth bitter; the Extremities ſometimes cold, and ſuddenly burning hot; and in ſhort, there is nothing bad that does not ſome Time or other happen in a malignant Fever; Spots, or Pimples of a purple Colour like Lentils, or reſembling a Flea-Bite, as ſometimes alſo of a violet, green, black, or livid Colour, and ſometimes large like a Wale, or Mark left by a Blow, alſo of a livid Colour, as alſo at other Times very large, and covering moſt Part of the Arms, Legs, and Back, but theſe of a redder Colour; but when they are ſimple Spots, they do not riſe above the Skin, but only diſcolour it: But indeed the *Small-Pox* are Puſtules which ſuppurate; and the *Meaſles* a leſſer Kind, which lie rough only upon the Skin, and ne'er come to Suppuration. A Raſh likewiſe ſometimes breaks out in prominent Pimples which ſuppurate. The Fever which is thus attended with Spots, is called *Febris Petechialis*, or, the *Spotted Fever.*

The Spotted Fever.

CONSEQUENCES. A Peſtilential Fever; for malignant Fevers at firſt private, grow popular and infectious, killing moſt whom they ſeize.

Of the Plague, or Peſtilence.

A Plague and a Peſtilential Fever are not the ſame Thing, or is the Plague always attended with a Fever, for according to phyſical Writers there are Plagues without Fevers: But when a Plague is joined with a Fever, it has its *Antecedents*, *Concomitants*, and *Conſequences*, as any other Fever. A Plague differs from a Peſtilential Fever, as the *Genus* does from its *Species*; for a Plague in general is a common Diſeaſe, or popular and contagious, killing moſt it infects; and all contagious Diſeaſes that do ſo are called peſtilential; where by the by it is to be noted that all popular Diſeaſes are, 1. *Sporadick*; when many Diſeaſes reign in the ſame Place at the ſame Time.

2. *Eudemick*; when the ſame Kind of Diſtemper ſeizes many at the ſame Time in the ſame Place; and hath its Riſe from ſomewhat that is familiar and natural to that particular Region: Or *Epidemick*; when the ſame Diſeaſe is tranſlated from another Country, and infects many together in the ſame Place; and none of theſe popular Diſeaſes are deemed peſtilential, unleſs it carries off a great many, and is contagious; when amongſt the *Greeks* it is called *Limodes*, which is the true Peſtilence or Plague.

Antecedents. A ſcanty Diet; an Air corrupted either by ſome Fault in the Place, by Winds or Tempeſts changing from their natural Courſes; Contagion brought from ſome other Place; venomous Exhalations from the Earth, upon Earthquakes, or ſinking Pits, *&c.* ſometimes juſt before its Seizure precede Epidemick Diſeaſes of one Kind or other, as the Spotted Fever, Small Pox, Meaſles, Dyſentery, Pleuriſie, *&c.* or the Small-Pox and Meaſles, not only amongſt Children, but grown Perſons, Carbuncles, Buboes, great Want of Neceſſaries, and even a Famine, which Plague by the *Greeks* is called ὸ λιμὸς μέτα λιμὸν, Plague after Famine.

CONCOMITANTS. A ſudden Dejection of Spirits, and great Feebleneſs; but the animal Faculty is ſaid to continue to the laſt Period of this Diſeaſe, as alſo the natural is ſometimes not greatly damaged; the Contagion ſeizes a great many, and moſt of them die, and it is communicated either by real Contact with an infected Perſon, or by ſomething exhaling from thence that participates of the Infection, and is inſeparable from it. With the forementioned Sinking of the Spirits, there is joined Palpitation of the Heart, Syncope's, and the utmoſt Inquietude, that the Patient cannot reſt in Bed, but toſſes about, and continually changes Place; and ſuch Decay of Strength is not from any manifeſt Cauſe, as large Evacuation, Watching, Grief, *&c.* The Pulſe is low, ſmall, quick, and unequal; the Heat is intenſe, ſometimes inwardly, at others more externally; but the inward is much the more intenſe, and the other ſometimes ſo little, that the Noſe, Ears, Hands, and Feet, are not at all, or very little hot; whereas by Reaſon of the internal Burning, they are not able to endure any Cloaths or Covering. A Raſh that is red, pale, black, livid, or other Colours, with Buboes and Carbuncles; all which taken ſeparately even from the Raſh to Carbuncles, do not prove the Diſeaſe to be a *Plague*, unleſs it hath alſo the other *Antecedents* and *Concomitants* of it; nor indeed is every Carbuncle a certain Indication of a Plague, but only that which depends upon, and is joined with the Cauſes of That. But when the animal Faculty is alſo affected, there enſues a Delirium, Loſs of Memory, continual Watching, Dozing, Lethargy, an Averſion to ſee Light, Singing in the Ears, Deafneſs, Tremblings, Convulſions, Stammering or Liſping, and an Inaptitude to move the Tongue, without great Difficulty; ſometimes alſo Nauſeouſneſs, and Vomiting. The Urine is ſometimes clear, and at others turbid, as if Flower was in it, moſtly of a Colour that is livid, or like Lead, ſometimes fetid, and at other like that of well People: The Sweat is ſometimes profuſe, and fetid, at unexpected Times, ſharp, and ſometimes cold, and a dropping of Blood from the Noſe. The Stools are fetid, ill coloured, and for the moſt Part ſmall in Quantity; ſome are ſlimy, white, yellow, green, and not very thin in Conſiſtence, but always fetid: A great Dryneſs, and Roughneſs of the Tongue; the Eyes without Brightneſs and Life, and big with Tears;

the Breath ſtinking, as alſo the whole Body of an ill Savour; an Appearance of a ſtinking Reliſh in every Thing taken into the Mouth; Heart-Burn, and Hiccup. Various Blotches and Ulcers upon the Skin, reſembling an Eryſipelas, Inflammations, Tetters, Leproſie, and Scabs; its Duration for one Day, three, four, five, ſeven, nine, and ſometimes it is protracted even to the fourteenth Day.

CONSEQUENCES. Generally Death, after which break out upon the Skin Spots of divers Colours, like to thoſe who die of any virulent Poiſon.

Symptomatick, or Secondary Fevers.

Hitherto we have treated of *primary continued Periodick Fevers*, which depend not on any other Diſeaſe, but come from a diſtant Cauſe, and are of themſelves a Diſeaſe. There are other *Continuents*, that are *ſymptomatical* or *accidental*, as depending upon ſome other Diſeaſe, from whence they neceſſarily flow, as a *Phrenſy*, *Pleuriſie*, &c. and a Fever ariſing from Inflammation of pure Blood is termed *Phlegmonodes*; from an Eryſipelas, *Eryſipelatodes*; from an Inflammation of the Liver, *Typhodes*; and ſo of all others. Of this Claſs is the *Lypiria*, wherein all the inner Parts burn, and the exterior are cold; the Burning Fever, and that which is from any vehement Inflammation of ſome inward Part or *Viſcus*, attended with a ſmall, quick, unequal Pulſe. Hitherto belongs the *Slow* Fever, from a latent Obſtruction, or Putrefaction, or Corruption of ſome *Viſcus*, a Fever the moſt mild of all, without almoſt any Symptoms, ſo that the Patient ſeems not to be ſick, unleſs from ſome Variations in the Urine and Pulſe; the Strength indeed of the Patient declines, that he can hardly walk upon his Legs; he is nouriſhed by no Diet, but lingers and waſts continually, and he often continues 40 Days or more. The like Slow Fever attends Cachectick Perſons, and Leucophlegmatick Girls, in whom it is called the *Febris alba*, or *white Fever.*

A Symptomatick Fever alſo proceeds from Milk corrupted in the Stomach of Children and Infants; the ſame from extravaſated and putrefied Blood; the like from Worms, but joined with a Thouſand other Symptoms, Delirium, Loſs of Memory, Convulſions, Faintings, Diſorders in the Sight and Hearing, Watchings, grating the Teeth, biting the Lips, ſighing and crying in an unuſual Manner, picking the Noſe, and a ſtrange Itching there, great

Inquietude of Body, and variouſly changing into Anger, Inconſtancy, *&c.* the Pulſe ſmall, weak, depreſſed, unequal, and hardly to be diſcerned; ſometimes nauſeating Food, at others of a canine Appetite, and all this while great Waſting of the Fleſh with Vomiting, Nauſeouſneſs, great Thirſt, the Stools ſometimes hard and dry, but oftener looſe and thin, the Urine frothy, white, thick, and always diſturbed, cold and fetid Sweats, frothing at the Mouth in Time of Sleep, the Lips moiſt in the Night, but dry during the Day-time; a ſtinking Breath, as if from Vinegar or Leven; a pale Countenance; Coldneſs of the extreme Parts; Swelling of the Belly; Gripes, and Colick Pains; Yawning; Itching; Rubbing the Noſe; and a ſhort dry Cough. The like happens from Crudity in Infants for Want of their Teeth, and ſwallowing their Food not duly broke; and this with Swelling of the *Hypocondria*, and Flatulencies.

Many of thoſe Fevers which are called *Symptomatical*, and eſpecially thoſe joined with Inflammation, may alſo be *Concomitant*; Such for Inſtance, as are themſelves produced at the ſame Time with an Inflammation, or are ſuch as neceſſarily bring an Inflammation with them; but becauſe it is of no Moment,

ment, as to any Intentions of Cure, it is not worth while to recite their various Kinds here; only one Sort therefore we ſhall explain here, which, as it naturally comes upon all before they are paſſed to full Growth, it is of the greateſt Concern that we ſhould be furniſhed with Means of Preſervation againſt it: And this is that ſort of Fever that precedes the Meaſles and Small-Pox, of which we ſhall preſently come to treat; but in the mean while it may not be amiſs to obſerve, that the Reaſon does not plainly appear why Phyſicians ſhould commonly rank *ſymptomatick* Fevers amongſt the *Continuents*; for if the Cauſe generating a *ſymptomatick* Fever be of that Nature, as will ſuffer it to come to a Period, there will then be a *ſymptomatick Intermittent*; nor do I ſee any Reaſon why ſuch a Cauſe ſhould not ſubſiſt.

Of the Meaſles and Small-Pox in Children.

ANTECEDENTS. A beating Pain in the Head and Temples; great Dozineſs, frightful Sleeps; Deliria; ſometimes Tremors and Convulſions; frequent Sneezing; Hoarſeneſs; a Cough; Difficulty of Breathing; Heat; High-

Colour, with a pricking Pain all over the Body; Pain in the Back; great Anxiety and Inquietude; involuntary Tears; Shining and Itching of the Eyes; the Face puffed and red; and a *Synochus* with all theſe Symptoms very much aggravated from the Beginning, inſomuch that the Diſeaſe ſeems always to be at its Height.

CONCOMITANTS. Puſtules, either of the larger Kind which ſuppurate, and are called the Small-Pox; or very ſmall ones, like little Aſperities upon the Skin with Redneſs, like an Eryſipelas, and are called the Meaſles: Theſe ſpread all over the Body, particularly the Face, Arms, and Legs, and they generally diſappear by the fifth or ſeventh Day, without any Suppuration. The true *Small-Pox* come out with Redneſs and Inflammation; tho' there is a Sort that throws out Puſtules like them in Bigneſs and Figure, by the common People called the *Chicken-Pox*, which are only Veſicles turgid with Serum, that break and dry away by the third Day without any Danger, and commonly happen without any Fever. The Meaſles and Small-Pox are reddiſh, white, yellow, purple, livid, and black; breaking out ſooner or later, and ſooner or later drying away; affecting either the exterior Parts of the Body only, or alſo ſometimes the inner Parts and *Viſcera*; and laſtly, they are either according to *Avicen*, *depurative*, wherein the excrementitious Parts of the Blood only putrefie, and are critically thrown out upon the Skin; or *corruptive*, wherein alſo the good Blood putrefies; thoſe preſage well, but theſe ill.

CONSEQUENCES. A thorough Recovery of Health after the Small-Pox with red, white, ſoft, diſtinct, and round Puſtules, which, in a ſmall Number, break out only upon the Surface, and not at all in the inner Parts; where the Fever ceaſes, or is much diminiſhed upon Eruption, and all the Symptoms abate, with a clear Voice, and Freedom of Reſpiration: But, on the other Hand, where the Puſtules come out ſlow, thick, large, double, continued, depreſſed, green, livid, black, or having black Specks in the middle, mixed with purple Spots, or ſuch as are livid or black, Sinking ſoon after Eruption, and the Swelling of all Parts ſubſiding with a Looſneſs, and a Urine bloody or black, or both Stools and Urine bloody, or conſiſting of pure Blood, with bleeding at the Noſe, from the Gums, or any other Part of the Body, with a high Fever, no Ways decreaſing after Eruption, Anxiety, Inquietude,

quietude, Difficulty of Breathing, great Thirſt, Flux or Dyſentery, there is the utmoſt Danger, if not Death.

The ANTECEDENTS, CONCOMITANTS, *and* CONSEQUENCES *to* periodick intermitting *Fevers.*

An intermitting Tertian.

If the Circuit of an *intermitting Tertian* does not exceed 12 Hours, it is called a *legitimate intermitting Tertian*; but if it exceeds that Space, it is termed ſimply a *Tertian*, or a *ſpurious Tertian*; and if it is protracted beyond 24 Hours, a *long Tertian.*

ANTECEDENTS. All thoſe Things which generate an excrementitious Bile; Intemperature, eſpecially of the Liver, and a hot and dry Stomach; Youth; Heat; a hot and moiſt Conſtitution of Air; Watchings; Care; Anger; Faſting; hot Meats and Drinks; too great a Uſe of hot Medicines; and too much Labour and Exerciſe; and theſe are the Fore-runners of a *legitimate Tertian*; but if theſe happen to phlegmatick or pituitous Conſtitutions, ſo that they can be joined with Cauſes generating dry or cold Humours, they will precede a *ſpurious* or *long Tertian.*

CONCOMITANTS. On the firſt Attack of the Fit a vehement Rigor, Shaking the whole Body, and as it were pulling the Fleſh; but it may alſo happen ſometimes in a more remiſs Degree, and on the ceaſing of that comes on a great Heat, diffuſing it ſelf all over very intenſely, though upon laying the Hand long upon the Patient it ſeems to remit, and not to be greater than that of the Hand it ſelf; Throwing off the Cloaths; Difficulty of Breathing; thick and hard Reſpiration; Thirſt; Bitterneſs in the Mouth; Dejection of Appetite; a Deſire of any Thing cold; Watchings; Deliria; Pains in the Head, eſpecially about its Height; the Pulſe in the Beginning of the Paroxyſm ſmall, weak, and ſlow; but on its Aggravation, high, quick, and equal. (Some ſay in other Reſpects unequal, in particular Regard to the Unequality of the Fever; that is, the Dilatation is quicker than the Contraction, as alſo when the Contraction is in leſs Time than the Dilatation; but both theſe are notorious Fictions, and contrived to explain the Expulſion of Fuliginoſities, and an Attraction of cool Air, and may eaſily be demonſtrated fictitious from the very Nature of Pulſes.) If a Perſon drinks when the Fit is at the Height, a Profuſion of Sweat riſes through the Skin; at this Time alſo there are bilious Vomitings, tho' theſe are more common in the cold Fit; high coloured Urine; a warm and equable Sweat all over the Body; the Pulſe quick and high; the Urine grows leſs red, and yellowiſh, of a moderate Conſiſtence, and at laſt with a whitiſh Cloud, or ſettling in it; and the Fever is then not protracted beyond the fourth Fit: But if the Urine is very red, and there appears no Cloud or Suſpenſion in it during the firſt Circuit, it will continue to the ſeventh Paroxyſm; and that *Tertian* which is attended with all theſe Symptoms, and ſhews in the firſt Fit a light and equal Sediment, will be very mild, and not continue beyond the third Return. It alſo will go away if Puſtules and Scabs break out upon the Lips and Noſe; as alſo upon a Looſeneſs.

CONSEQUENCES. *Hippocrates* ſays: 'Whatſoever Fevers which do not intermit grow ſtronger on the third 'Day, it portends Danger; but if they 'intermit but in any Reſpect there is 'no Hazard at all.' But this is not univerſally true, as will be made appear from the following Demonſtrations: A *Spurious Tertian.*

An

An intermitting Quotidian.

Antecedents. All thoſe Things which generate Phlegm; a languid Warmth of the Bowels; a cold and moiſt Diet, and Plenty of it; a corpulent and pale Habit; contracted Veins and Arteries; Declenſion in Age; female Conſtitutions; Inactivity; intemperate Eating; a cold and moiſt Temperature of the Seaſon, Air, Climate, or Place; long Sleeps after Dinner; the Uſe of cooling Medicines; Liſtleſneſs of Body and Mind; much Sleeping; Dreams of Water, Snow, and Drowning; a ſlow, ſmall, ſoft Pulſe; and the Urine ſometimes white, pale, and thin, and at others, thick with much ſettling.

Concomitants. It comes upon a Perſon chiefly in the Night Time, and not ſuddenly, but by Degrees, with great Cold in the extreme Parts; nor is the Shaking like that in a *Tertian*, but gentler, and afterwards a Heat ſlowly, with Difficulty, and much Inequality increaſes, ſo that ſometimes the Patient ſeems to be hot, and at others to be cold; and this Heat is not ſharp or dry, but attended with Moiſture, not unlike what ariſes from the Burning of green Wood, and it affects the Feeling, as if paſſed through a Seive: If the Hand be continued upon the Patient, the Heat after ſome Time appears more intenſe, and it diffuſes univerſally; but the ſick Perſon is neither impatient of Cloaths, ſo as to throw them off, nor does he breath thick or hard, nor covet Drink, nor is his Tongue dry, but moiſt. In the Attack, the *Hypochondria* are ſwelled and puffed up; and the Countenance continues pale even to the Height of the Fit, and is ſublivid and ſwelled; the Body is lumpiſh, and there is a great Propenſity to ſleep, eſpecially in the Fit, and in which there is alſo ſometimes a Sinking at Stomach, as it is commonly called. The Urine is at firſt white, thin, crude, and ſometimes depoſites a Sediment; but that Sediment is not in Reality the Effects of true Digeſtion, but a Portion of crude Humours; in the Progreſs of the Diſtemper it becomes thicker, more turbid, and ſometimes red; the Stools are crude and ſlimy. At firſt there is no Sweat, but after ſome Time the Patient begins to ſweat towards the Declenſion of the Fit. The Pulſe is very ſmall and low; but about its Increaſe quicker and unequal, and throughout ſlower than in any other Fever; whereas in a *Tertian* it is greateſt and quickeſt, but in a *Quartan* between both. The Fit is extended to eighteen Hours, and ſometimes to twenty four, ſo as to reſemble a *Continuent.* This Fever continues a long Time, (tho' it ſeldom happens,) as three or four Months, and ſometimes much longer.

CONSEQUENCES. A Cachexy, a Dropſie, a Cerus, Lethargy, and the like grievous Diſeaſes.

An intermitting Quartan.

ANTECEDENTS. All thoſe Things which generate black and melancholy Humours; the Age above forty Years; Autumn; a cold and dry Conſtitution; a weak, obſtructed, and tumid Spleen; the Uſe of groſs Food, ſuch as Beef, Stag, or Brawn, ſalted and Smoak-dried, foul Water-Fiſh; coarſe Herbage; Peaſe; Beans; unfermented Bread; foul Wines, and Beer; Vinegar, whence *Hippocrates* aſſerts Vinegar to be hurtful to melancholy Perſons; Cares; Grief; hard Study; Hurry of Employ; ſuppreſſed Evacuations, and chiefly that of the Hemorrhoids; the Colour of the Face and whole Body dusky, and unequally inclining to Blackneſs, and Spots ſometimes all over the Body; a dry and lean Habit of Body; Sadneſs of Countenance; Love of Sollitude; diſturbed

Sleep,

Sleep, and Dreams of Death, dead Carcaſſes, Funerals, and the like Occaſions of Sorrow; the Urine, if nothing of Melancholy is ſeparated with it, is thin and white; but if it has Melancholy in it, it is thick, livid and black.

CONCOMITANTS. Its Attack with Yawning and Stretching, and a troubleſome Senſation all over the Body, which is followed by a Shaking at firſt gentle, but in the Progreſs of the Fit by Degrees greater, until it becomes vehement, with a chattering of the Teeth, as thoſe who ſhudder with the Winter's Cold; and it gives a Senſation of ſomething not ſo much pungent, as ponderous, compreſſive, and as it were breaking the very Bones, which Pain by the *Greeks* is therefore called ὀστεοχόπη; and afterwards a Heat begins by Degrees, not raging and burning as in a *Tertian*, but remiſs. It terminates in a long and perfect Ceſſation of the Fever: The Pulſe through its whole Progreſs is ſlow and ſmall, and in the Beginning ſlower than in any other Fever, and this Property is preſerved through its Riſe and Height much beyond what it is in all others. The firſt Days there is no Sweat, but afterwards very large ones. The Urine is in the Beginning white, thin, and limpid; but as the Diſeaſe goes on, grows more red, and both its Colour and Contents are frequently changed. The Thirſt is moderate between that of a *Quotidian* and a *Tertian*, greater than in one, and leſs than in the other. The Duration of the Fits, much the ſame as a *Tertian*, and ſometimes longer.

CONSEQUENCES. A ſhort and ſalutary Dyſentery; and *Hippocrates* ſays, *Lienoſis difficultas inteſtinorum ſuperveniens, bonum*; and elſewhere, *Qui Lieni difficultate inteſtinorum corripiuntur, iis longam ſupervenientem Dyſenteriam aqua inter Cutem, aut Lævitas inteſtinorum excipit, & moriuntur.* A Dropſie, or a Scurvy, if it be attended with any Diſorder of ſome of the more noble Parts, as the Liver, Stomach, or Spleen; it is for the moſt Part fatal to People of ſixty Years of Age, and mortal when it turns into a *Continuent*; in like Manner a dangerous Hemorrhage at the Noſe, and a Cachexy.

A Semitertian Fever.

A *Semitertian* is, 1. *Phricodis*, commonly called a *Shaking* Fever; and, 2. *Imitritæos*, which, properly ſpeaking, is a Fever compounded of an *intermitting Tertian*, and a *continued Quotidian*, ſo that it never comes to a final Termination; and in this Diſeaſe it is particularly to be remarked, that through its whole Progreſs the Shakings and Rigors very often return, and eſpecially in the Acceſſion of the *Tertian*, wherein it differs from the Rigours that happen upon internal Abceſces; for *this* returns many Times in a Day without any Manner of Certainty, and for the moſt Part with a ſmall Appearance of Sweat, which the Rigour of a *Semitertian* has not. It is for the moſt Part mortal, and affects the Mouth of the Stomach, and nervous Parts; it brings on a Lethargy, Delirium, and faint Sweats; greatly dries the Tongue, and cauſes *Syncope's*, vehemently affecting the inner Parts, and hath in all Reſpects, as *Galen* expreſſes in his Book *de Typis*, a very unruly Progreſs.

The ANTECEDENTS, CONCOMITANTS, *and* CONSEQUENCES *of erratick Fevers.*

ANTECEDENTS. A vitious Diſpoſition of divers Humours, from Errors in Diet, as the Mixture of many Kinds of Food, ſome of which are of eaſie, others of difficult Digeſtion; ſome diſpoſed to generate Bile, others Phlegm, *&c.* Inequallity and Changeableneſs of Seaſons, and Diverſities of Heat, Cold, Moiſture, or Dryneſs every Day; and other Fevers not finally terminated.

Concomitants. Vague and uncertain Acceſſions, without any ſet Form, or the Appearance of a Fever without any Rule or Method of Progreſs; in the firſt Acceſſion ſometimes a Rigour is followed by Heat and Sweat, in the ſecond no Rigour, but a moderate Shivering, and the Heat goes off, or their Deceſſions, without any Sweat: Now they come on only with a Stretching, have a protracted Heat, and end without Sweat; at another Time with Vomiting and Thirſt, and ſometimes without either: Sometimes they return but once a Week, at others twice or three Times, but without any Certainty, or ſet Periods; ſometimes they leave the Body free for five or ſix Days, at others they return at three or four Days End, and ſometimes come even twice in one Day.

Consequences. They commonly ſettle into *Quartans.*

CONCOMITANTS *to Fevers in General, or the common Symptoms of all Fevers.*

Pain of the Head; Watching, with or without Pain; a dozing Sleep in ſome Fevers, eſpecially in *Quotidians*, *Semitertians*, and *Malignant*; Delirium; Phrenſie; Convulſions, eſpecially in *Malignant* and *Peſtilential* Fevers; Bleeding at the Noſe; a Cough; a Tongue dry, black, rough, inflamed, ſometimes furred with Slime, at others with a Cruſt, which now and then likewiſe goes over the whole Mouth, and the OEſophagus, even down to the Mouth of the Stomach; Thirſt, and that ſometimes with a great Burning at Stomach, and at others with a ſcorching Heat from the Lungs, and great Burning in the Breaſt; Hiccup; Cardialgy; Loathing; Vomiting; Looſeneſs; Symptomatick Sweats; Fainting; Syncope's, eſpecially in the Malignant Kind; Pain in the Loins, Inquietude, and an Inappetency common to almoſt all Fevers.

But although many of theſe are enumerated under all Fevers in their reſpective Places; yet becauſe they are uncertain, and may happen to this or that Sort, and ſometimes more, and at others fewer, chance to appear in the ſame Fever, in Proportion to its Intenſion or Remiſſion, it was judged proper to recite them here together, that it may be known theſe are not all neceſſary Conjuncts of *this* or *that* Fever, or to belong to any particular Period; but that ſome Fevers happen without them, moſt of them eſpecially, and others with them all, or moſt of them at leaſt, as will abundantly appear from thoſe Propoſitions in which we are going about to demonſtrate, *What is a Fever*: And theſe are as follow:

What is a FEVER.

PROPOSITION I.

There is no FEVER *without ſome Fault in the Blood.*

By Blood, I would be here underſtood to mean with *Galen* and other phyſical Writers, whatſoever naturally flows through the Arteries and Veins; for they ſo call that circulating Fluid, although it is not pure Blood, but compounded of Blood and other Humours. Becauſe *theſe* therefore are the

Requiſites of a natural Pulſe, that every Stroke of it againſt an Artery hath a certain *Impetus*, that it preſſes the Artery outward for a certain Time, and that ſome certain Space intervenes between every Appulſe of it againſt the Finger; with many other Properties of like Kind, that are moſt remarkably known to be inſeparable from the Pulſe of a Perſon in Health; where *theſe* do not happen, the Blood is neceſſarily vitiated, for while it continues its natural Properties in the Veſſels, the Pulſe will alſo be natural; but there is no Fever wherein the Pulſe does not deviate from its natural State, that is to ſay, wherein it does not want ſome or all of *thoſe* Requiſites which conſtitute a healthful Pulſe; and therefore there can be no Fever without ſome Fault in the Blood; according to the Propoſition.

Becauſe therefore every Fever is attended with ſome Fault in the Pulſe, and every Fault of the Pulſe with ſome Fault in the Blood, it concerns us now to enquire how many Ways there are to vitiate the Blood, and whether every one of theſe can diſorder the Pulſe: For if we can find ſome or all of thoſe Ways which vitiate the Blood, neceſſarily to induce ſome Fault in the Pulſe, and moreover that if with all the Relations and manifold Affections with which all Kinds of Fevers are attended, it comes neceſſarily to be diſcovered that *this* or *that* particular Kind, or *this* or *that* Fault of the Blood, is from *this* or *that* Cauſe, and thence be collected ſome one Thing that is common to every Fever, we ſhall then know what a Fever is in General. To this therefore let us immediately proceed.

PROPOSITION II.

The Blood cannot be vitiated, unleſs its Motion, Quantity, or Quality, is vitiated: There are no other Ways of diſordering it, and every one of theſe is attended with a vitiated Pulſe.

It is the current Opinion that nothing can be intimately vitiated, and as they term it commonly, in its *ſubſtantial Form*, unleſs a Progreſs be made towards ſuch a Change by the Mediation of thoſe Qualities that are eſſential to its Exiſtence, into which the Corruption is firſt to be induced before it can reach the Form it ſelf. But if we will hear *Ariſtotle* himſelf, this Change of Qualities is the Change of its Form, I ſay, of its, ſo much talked of, *ſubſtantial* Form; which, whether it be in the Elements, or in the Compound, he aſſerts to be nothing elſe than, in the *former* certain primary Qualities, and in the *latter* a particular Contemperation of them together. But ſince *Democritus* hath before advanced the ſame Opinion with *Ariſtotle*, although not perhaps in the ſame Words, we may rely upon the Opinion of either, or both, thoſe great Men in the Caſe before us, and according to their Doctrine pronounce the Blood to be vitiated where its Qualities are ſo, becauſe the Blood is a Compound of them, whether ſuch Corruption is ſuppoſed to be communicated by thoſe Qualities only, or gone ſo far into that ſecret and conſtituent Principle wherein its very Eſſence as Blood conſiſts. And here by the Way it is deſired to be taken Notice, that it is of no Purpoſe to diſtinguiſh in this Propoſition, wherein the Blood is ſaid to be vitiated, whether it is ſo formally and ſubſtantially, ſince that is not ſeparable from its Qualities.

But becauſe that an Animal may exert thoſe Operations which are derivable from the Blood, it is not ſufficient, that this ſame Blood ſhould be compounded of certain Elements, and be in a particular Manner blended together; but that alſo it ſhould ſubſiſt in ſuch a Quantity, as from it may be derived whatſoever is neceſſary to circulate through the animal Canals, and as much as is neceſſary for a continual Recruit; it follows that as often as the Blood is defective in Quantity, although not ſo changed in Quality as to induce a Diſeaſe, it may properly be ſaid to be vitiated; not as ſuch a particular Compoſition, but as there is not enough of it, for the Preſervation of that animal, for whoſe Sake ſuch a Fluid is contrived by Nature: And by the ſame Way of Reaſoning it will appear, that the Blood ought to be accounted in Fault, although exiſting both in due Quality and Quantity, whenſoever it flows not according to the known Laws of Circulation (for this we always underſtand when we ſpeak of the Blood's Motion abſolutely) from the Heart through the Arteries, and thro' the other Canals back again to the Heart; for ſuch a Circulation is neceſſary to an Animal's Preſervation, and to enable it to perform thoſe Functions that are requiſite to it as ſuch. Becauſe therefore, beſides the Quality of the Blood, there are no other Affections belonging thereunto, but its Quantity and Motion, it is plain that the Blood cannot be vitiated any other Way but in its Motion, Quantity, or Quality, or that it can be in any other Reſpect faulty, which is the firſt Part of the Propoſition.

It remains therefore to ſhew, that from which ſoever of either of thoſe Cauſes the Blood is faulty, whether in its Motion, in its Quantity, or in its Quality, the Pulſe is always neceſſarily diſordered; and that it may in particular happen from a vitiated Motion, is thus eaſily to be demonſtrated.

Becauſe the Celerity and Slowneſs of the Blood's Motion conſtitute the Meaſures of its Velocity; and the Diverſity of that *Impetus* with which the Arteries are thruſt outwards, is meaſured by its Strength or Weakneſs; and the Diverſity of thoſe Intervals wherein the Blood is alternately protruded through the Arteries, conſiſts in the Rarity and Frequency of the Pulſe; theſe, and all other Conditions of like Kind, ſucceed regularly or irregularly in the Pulſe, as the Blood flows regularly or irregularly through the Arteries: and therefore from a vitiated Motion of the Blood in the Arteries muſt enſue a diſordered Pulſe.

The Pulſe diſordered by a vitiated Motion, and by an augmented Quantity of Blood.

It is yet of a more difficult and extenſive Nature to demonſtrate, how the Pulſe is diſordered from a Blood vitiated in Quantity or Quality, but that it is ſo from both Cauſes is equally evident.

Since the Blood may err in Quantity, either by abounding, or being deficient, firſt of all let it be ſuppoſed in Fault from too great a Quantity only, in all other Reſpects remaining in its natural State. Becauſe then the Blood is ſuppoſed more in Quantity than it ought to be, the Arteries will be fuller than natural, and conſequently the Pulſe fuller alſo; and becauſe alſo with this over Quantity there is in other Reſpects ſuppoſed its natural Qualities, therefore in ſuch an over Quantity will there be contained more of that Liquid which is deſtined for the Nerves, and conſequently will more of it be ſeparated into, and flow through them, than in a natural State: The over Quantity of this Liquid flowing through the Nerves cauſes the Elaſtick Fibres, into which it runs, to contract more frequently, and with greater Strength. The Heart is a Complication of ſuch Elaſtick Threads; ſince therefore with a greater Quantity of Blood there runs a greater Quantity of Fluid into thoſe conſtituent Elaſtick Threads, the Heart will beat with more Strength and Frequency in ſuch an over Quantity of

Blood, than when it is in its natural Quantity: If therefore from a more ſtrong and frequent Contraction of the Heart, the Pulſe is alſo more ſtrong and frequent, of Conſequence muſt a greater Quantity of Blood make the Pulſe more ſtrong and frequent than natural.

The Pulſe alſo is from the ſame Cauſe greater, for ſince with all the forementioned Conditions there is likewiſe joined a Fulneſs of the Arteries, from ſuch an increaſed *Impetus* of the Heart, will ſuch an increaſed Quantity of Blood more diſtend the Arteries, and thruſt their Coats outwards for a longer Space of Time; that is, the Pulſe will be greater.

But theſe Appearances yet ariſe more neceſſarily on two other Accounts; for becauſe the Arteries are filled with a greater Quantity of Blood, inſomuch that they cannot be more diſtended but by a greater Quantity yet protruding into them, and endeavouring their farther Dilatation; their Coats in all Parts endeavour to dilate outwardly, and by that Means the more preſs againſt every Thing with which they come into Contact; and as the whole Body of the Brain is wrapped round by the Arteries of the *Pia Mater*, by a greater Quantity therefore of Blood the Brain muſt be more compreſſed, and conſequently in any given Time a greater Quantity of Fluid derived into the Nerves, and contractile Membranes, than in the ſame Space of Time from a leſſer Quantity of Blood; whence the Heart muſt beat more frequently and ſtrongly, and the Pulſe alſo be ſtronger, quicker, and greater. Again, becauſe the Blood is ſuppoſed to abound in Quantity, and on other Reſpects to be in a natural State, therefore in every Reſtitution of the Auricles and Ventricles of the Heart, more Blood than natural flows into their Cavities, or a Quantity containing more Particles of Blood; but by Nature theſe are all equally hot, and therefore in a greater Quantity of Blood there flows into the Cavities of thoſe Parts more hot Particles than in a natural Quantity, whence there will ariſe in thoſe Parts a Heat greater than natural, whence alſo a Derivation of more Fluid through the Nerves into thoſe Muſcles, and conſequently a ſtronger and quicker Contraction, and a correſponding Pulſe. But what is here advanced concerning the Heat of the Blood, appears not to be the Reſult of any new Quality, but its Quantity only, for it excites a Senſation of greater Heat, not becauſe the Heat is more intenſe in every reſpective Particle of Blood, but becauſe while the ſame Degree of Heat continues in every ſingle Particle, thoſe Particles are increaſed in Number.

Yet if all theſe do not ſuffice to account for the Diſorders of the Pulſe from a greater Quantity of Blood, the Reader may turn back to what hath been ſaid concerning an intermitting Pulſe; for from thence it appears, and is plainly demonſtrated, that every Kind of Inequallity in the Pulſe is to be accounted for from this very increaſed Quantity of Blood, even thro' all the Varieties of Intermiſſion, and Death it ſelf: And therefore does it neceſſarily conclude from all the forementioned Premiſſes, that a diſordered Pulſe is inſeparably the Attendant of an increaſed Quantity of Blood.

Here it is however to be further noted, that the Quantity of Blood may be increaſed to ſuch a certain Degree, as to change the Pulſe, during ſuch an Increaſe, from a ſtrong and quick one, into ſlow and weak; for if the Arteries are ſo diſtended, that they preſs upon the Brain too much; that is, if they ſtraiten the Nerves, and render their Capacities leſs, ſo as not to admit of a due Influx of Fluid into them from the ſecerning Glands; and in like Manner if the Arteries, running amongſt the contractile Fibres, do by their Diſtention outwardly ſo compreſs thoſe minute Tubes, that their Cavities are leſſened, and the Admiſſion of that Fluid neceſſary to contract them rendred more difficult, ſuch Fluid will diſtil into them more ſparingly, and in leſſer Quantity, whence their Contractions, and that of the Heart it ſelf, will be ſlower and weaker, that is, the Pulſe will be ſlow and weak; and therefore in all Reſpects does the Propoſition hold good. On the contrary likewiſe is it manifeſt what Diſorders of the Pulſe muſt ariſe from a Quantity of Blood leſs than natural; wherefore it ſtands demonſtrated, that a diſordered Pulſe is the neceſſary Conſequence of the Blood's Error in Quantity.

The Pulſe diſordered from a diminiſhed Quantity of Blood.

In the third Place it concerns us to enquire, whether a diſordered Pulſe is occaſioned by Blood vitiated in Quality, and whether from its being vitiated in all its Qualities, or only ſome of them. Firſt then, it is manifeſt that its Qualities can be vitiated only in two Reſpects, either in that Principle whence they all reſult, or when that Principle, in it ſelf naturally diſpoſed, is reſtrained from Exertion, or, which is the ſame Thing, produces no Qualities, and which is all one as to

Only two ways of vitiating the Blood, either in its Principles, or the Qualities reſulting therefrom.

the animal Functions, as if it was plainly deſtitute of all Qualities, or produced ſuch as are vitiated. Becauſe therefore the Origin of Operation, or of Qualities, both according to *Democritus* and *Ariſtotle*, is nothing elſe than a certain Power, or Condition of Cohæſion in the Parts conſtituting every Compound; by whatſoever Cauſe therefore that certain Power, or Condition, is vitiated, the Origin of Qualities will be ſo to, and conſequently the Qualities thence ariſing. Every Power likewiſe of a determinate Degree can be diſordered only in two Reſpects, that is, in being greater or leſs than natural; and in like Manner every Condition of Cohæſion between the Parts of a Compound can be but two Ways perverted, either in a Separation of ſome Parts from their natural Contacts, the others remaining as before, or a Change in the natural Contacts of all the compounding Parts: And how the Pulſe is affected by all theſe ſeveral Ways is now to be ſhewn.

And firſt of all let there be ſuppoſed a greater Cohæſion than natural between the compounding Parts of the Blood, that is, that the primary conſtituent Parts have a greater *Niſus ad Contactum*; and there be ſuppoſed alſo a certain Point of Time wherein ſuch a Cohæſion of the Parts greater than natural firſt takes Place; before this certain Time then all Things will be in their natural State, the Nerves will contain their natural Quantity of Fluid, which will flow in its natural Pace, and contract the Heart, and determine the Pulſe, as in a State of perfect Health. But becauſe by the circular Motion of the Blood, ſomething is continually ſeparated from it that paſſes into Perſpiration, Sweat, Urine, Bile, Phlegm, Spittle, and other Humours, every one of which hath a determinate Quantity of Cohæſion in the whole common Maſs, that cannot be overcome, but by the natural Motion of the Blood; where therefore the Cohæſion between the Particles of Blood is ſo much increaſed that the Humours are not ſeparated from it in any given Space of Time, as they would be in a natural Cohæſion, ſo that the Veſſels become more full, the Arteries will preſs more ſtrongly outward from the very Moment of ſuch an augmented Cohæſion; and therefore as they then alſo find the Nerves turgid with their natural Fluid, that will flow into the conſtituent Fibres of the Heart, both in greater Quantity, and faſter, whence the Pulſe will be quicker and ſtronger, and by Means of an increaſed Quantity of Blood alſo greater and fuller.

The Pulſe diſordered from an increaſed Cohæſion of the Parts conſtituting the Blood.

But in the mean Time, by Reaſon of an augmented Cohæſion, there is little or none of the nervous Fluid ſtrained through the Glands of the Brain after a few Pulſations, the Pulſe then becomes weaker and ſlower than natural, and may in a little Time altogether ceaſe beating, when the nervous Fluid ceaſes to flow into the Fibres contracting the Heart, altogether, or in a very little Quantity: The Cohæſion therefore of the compounding Parts of the Blood being vitiated, ſo that it becomes greater than natural, the Pulſe will alſo correſpond therewith.

As alſo from a diminiſhed Cohæſion.

Becauſe by the *Impetus* of a natural Motion, attended with a Power of Cohæſion between the compounding Parts of the Blood that is likewiſe natural, the whole Maſs is reſolvable into its ſeveral Humours, ſo that in a given Space of Time they are derived into their reſpective Canals in their natural Quantities; therefore the ſame *Impetus* being given, but a leſſer Degree of Cohæſion, that is, the Reſiſtance neceſſary to be conquered by ſuch an *Impetus* of Circulation, in Order to a due Secretion of Humours, being leſſen'd, a greater Quantity of them than natural will be ſeparated in any given Space of Time: And hence likewiſe will it alſo follow, that more Fluid will paſs through the Nerves, whence a more frequent and ſtrong Pulſe. Becauſe moreover from the ſame Diminution of Cohæſion, the Heat is put into more Liberty of Motion, with other Particles alſo of greateſt *Impetus*, whence the Blood ſwells, rarifies, boils, and ferments, ſo as to take up more Space; on theſe Accounts likewiſe will the Pulſe be affected, as from a Diſtention of the Arteries by too much Fluid, and the ſame Diſorders in that ariſe, as we have already ſhewed to happen from an augmented Quantity of Blood.

From too free an Heat, and ſuch like vellicating Particles, the Heart feels a *Stimulus*, or a Senſation ſharper than natural, by the Means of which a greater Quantity of nervous Fluid is derived into it, and the Pulſe is more frequent and ſtrong with all thoſe other Concomitants reſulting from too great a Diſtention of the Arteries. The Pulſe is therefore equally diſordered both from an augmented, and a diminiſhed Cohæſion of the conſtituent Parts of the Blood.

Yet this Diſorder of the Pulſe does not neceſſarily happen from a vitiated Cohæſion of the Particles, whether it be total

The Pulſe is probably, but not neceſſarily diſordered by a vitiated Cohæſion.

total or partial. Suppoſe, for Inſtance, this laſt to be the Caſe; and therefore ſome only of the conſtituent Particles of the Blood continue in their natural Contact, and therefore from them alone can be generated a Supply of the nervous Fluid; which then being not generated from all the Parts of the Blood, will be leſs than that Quantity required to produce a natural Pulſe, and conſequently on this Account will the Pulſe be ſlower and weaker; that is, it will be diſtempered. But becauſe it may alſo happen, that although thoſe other Parts ſeparated from their natural Contacts may not be able to produce all thoſe Effects, to which the Particles conſtituting a natural Blood are deſtined, yet they may ſupply Recruits to the nervous Fluid in Quantity ſufficient to a natural Pulſe; and therefore will there be a Caſe where the Conditions of Cohæſion in thoſe Parts conſtituting the Blood are vitiated, without any Diſorder of the Pulſe. Again, becauſe it may in like Manner happen for the Particles which are divided from their natural Contacts, to change into ſome other Diſpoſition, ſuitable for the Production of a greater and more vivid Quantity of Spirits, the Pulſe muſt then alſo be diſordered, and in the ſame Circumſtances as have been deſcribed already, to proceed from a diminiſhed Cohæſion of the ſame Particles.

The like to theſe will further happen, if all the conſtituent Particles are looſened in their natural Cohæſions; for if by ſuch Separation ſuch a new Diſpoſition ariſes that will yield fewer or no Spirits at all, the Pulſe will be ſlow, and weak, or altogether ceaſe; if the Spirits are generated in Quality and Quantity like that which is natural, although nothing elſe natural reſults from this new Compoſition, the Pulſe will be natural; but if it generates Spirits in greater Quantity, or of greater Activity, the Pulſe will then be quick and ſtrong, ſuch as is before explained to happen in a diminiſhed Cohæſion. Therefore the Conditions of Cohæſion in the conſtituent Particles being changed, by their Separation either totally or partially, does not always neceſſarily change the Pulſe.

The Cauſe hindering the Exertion of the Blood's Qualities is not intrinſick, but ſome extrinſick Body:

Let it be next ſuppoſed, that the Principle of the Blood's Qualities, the Conditions and Quantities of Cohæſion in its conſtituent Parts to be natural, but that this Principle is ſo affected that no Qualities can flow from thence, there then muſt be ſome Cauſe hindering their Efficacies, and ſuch a one as cannot be intrinſick in the Principle it ſelf; for otherwiſe that could not be in its natural State, and therefore muſt it be altogether external, and brought into Contact with the Particles of the Blood; nor can it be any Thing but ſomething corporeal, as alſo ſome Species of Matter that never makes a Part of the Blood, but is altogether foreign to it, and the Veſſels in which it circulates.

This Matter therefore, foreign to the Blood, is either of ſuch a Bulk, as to take up more Space than is naturally found between two Particles of Blood, or it juſt fills ſo much Space: In the firſt Caſe it thruſts the Artery outwards more than natural, from whence its Preſſure is greater upon the Brain, the Influx of the nervous Fluid more frequent, and in more Plenty into the Muſcles, whence the Pulſe is ſtronger and more frequent; And further, if this Matter mixed with the Blood be of that Nature, as not to remain at reſt in Contact with its Particles, but to agitate it on all Sides, ſo that the whole Maſs becomes more looſened in its Cohæſion, it will rarifie, and riſe in Bubbles, and the like, whence a greater Protruſion of the Arteries outwards, a greater Preſſure upon the Brain, *&c.* All which happen in the firſt Moment of its Mixture, for then the Nerves are naturally full, that is, they are furniſhed with their natural Quantity of Fluid. But becauſe by this Sort of Matter the Quality of the Blood is ſuppoſed to be reſtrained, this muſt therefore be in ſome or all of 'em; if in all of them, the Generation of Spirits is cut off, whence ſucceeds a ſenſible Debility, and a Slowneſs of the Pulſe; the like alſo happens when all the Qualities are not reſtrained, ſo it chance to be that whereby the Spirits are generated in the Brain; but this Damage may again be repaired by Means of the ſame Mixture, if it chance to be of that Nature, as in its Paſſage through the Glands of the Brain will admit of a Separation of ſuch Parts from it into the Nerves, as from a natural Blood; and if ſuch a Separation happens in a Quantity greater than natural, the Pulſe will become more quick and ſtrong than natural; if leſs, ſlower and weaker; and if equal, a natural Pulſe. But it never fails in this Circumſtance, but that the Pulſe is fuller than natural, by Reaſon of its Exceſs in Quantity from the foreign Mixture.

When the Blood is neceſſarily vitiated by the Mixture of ſuch Matter.

It again further appears, that when this foreign Matter poſſeſſes thoſe Spaces only which are contained between every two Particles of Blood, it ought to remain there at Reſt, or in ſome Meaſure ſo; for otherwiſe it would ſhake thoſe Particles further aſunder, and make greater Spaces between them, under various Diverſifications. But if this Matter thus cauſing more Room, immediately on its firſt Moment of Admiſſion falls into quiet Union with the Particles of the Blood, the Arteries muſt be more protruded outwards, and the Pulſe become fuller, more frequent, and more ſtrong, by Means of the Quantity of Spirits already prepared, and exiſting in the Nerves; but becauſe this foreign Matter is ſuppoſed quietly to remain in Contact with the Particles of Blood, and theſe again to keep in Union with them, whence a more conſiſtent Maſs of Blood will be generated, or a Coagulation of it more or leſs in Proportion to its Meaſure of Union with the Blood, whether it be abſolutely ſo, or joined with it only imperfectly in ſome few Points of Contact; on this Account therefore will the Velocity of the Blood be leſs, and its Quantity of Cohæſion greater; whence a leſſer Quantity of Spirits will be generated, and the Pulſe be ſenſibly weakened and ſlower, unleſs in like Manner this Inconveniency be repaired from the Nature of this Mixture being ſuch, that howſoever ſlow it flows through the Arteries, it is able to ſupply a Quantity of Spirits greater, leſſer, or equal to what is natural, whereunto the Pulſe does correſpond in its Qualities. But whether this Mixture goes into theſe Contacts with the Particles of Blood, or agitates its Maſs on all Sides, there will immediately enſue ſome Diſorder in the Quantities and Conditions of its Cohæſions, whence correſpondent Irregularities in the Pulſe will follow.

Again, it may poſſibly happen that this Mixture in the Blood may be in leſs Quantity than the leaſt Particle thereof, but of ſuch Energy as to communicate thereunto ſucceſſively a preternatural *Impetus*, whence will flow ſome or other of thoſe Affections already explained, and a Pulſe ſuitable to ſuch Affections.

Laſtly, This Foreign Cauſe is either mixed with the whole Maſs of Blood, or only with ſome Part of it flowing through the Brain, at certain Intervals of Time, that is, as it happens to be thrown into its Courſe of Circulation; and if it happens to unite with the whole Maſs, the Diſorder of the Pulſe is continual; but if it recurs at certain Intervals, and mixes only with ſome Part, ſuch Diſorder is diverſified, as it may eaſily be conceived in all its poſſible Circumſtances, from what hath been already demonſtrated. The Blood therefore cannot be vitiated, unleſs it be vitiated in its Motion, Quantity, or Quality; there is no other Way of vitiating it; and with every one of theſe is the Pulſe diſordered: which was to be demonſtrated.

PROPOSITION III.

There is no Fever without ſome Fault in the Motion, or Quantity, or Quality of the Blood; or in ſome or all of theſe together.

Becauſe there is no Fever but from ſome Fault in the Blood, with which is conjoined alſo a Diſorder in the Pulſe; and that the Blood cannot be vitiated but in its Motion, Quantity, or Quality, with every one of which the Pulſe is diſordered, as already proved in the foregoing Propoſition; therefore there can be no Fever without ſome Fault in the Blood, either as to its Motion, Quantity, or Quality, and conſequently is the firſt Part of this Propoſition true: But becauſe it may happen, that in Conjunction may be vitiated its Motion and Quantity; Motion and Quality; Quantity and Quality; and its Motion, Quantity, and Quality altogether, as is in it ſelf apparent, and will hereafter be more fully demonſtrated; and that from every one of theſe Defections the Pulſe will alſo come into Diſorder; therefore the Pulſe will in a much greater Degree, and more eaſily be diſordered from ſome or all of thoſe ſuppoſed Defections of Blood together; which in like Manner is plain from the foregoing Explanations, and the Doctrine of Pulſes, and will be occaſionally more clearly demonſtrated in the following Propoſitions. This therefore under preſent Conſideration remains proved.

And thus we have endeavoured to come at the Knowledge of that certain Condition, without which no Fever can ſubſiſt; and this Condition appears to be a Fault in the Blood, as to one, more, or all the above-recited natural Affections belonging thereunto: But becauſe the neceſſary Conjuncts with any Thing may be different from that Principle which conſtitutes the very Nature of its Being, and is commonly called its Eſſence; therefore in order to underſtand what a Fever is, it is not ſufficient to know that it cannot ſubſiſt but with ſome one of the already enumerated vitiated Affections of the Blood, more, or all of them; but it lies upon us to find out ſomething elſe in a Fever, which makes the neceſſary Connexion between a Fever and thoſe vitiated Affections, and is alſo the Cauſe of all other conſequential Diſorders both of the Mind and Body, that are met with in a Fever; or to demonſtrate that theſe very Faults in the Blood, which hitherto have appeared to us only as neceſſary Conditions, without which a Fever cannot ſubſiſt, to be in Reality that very Thing wherein the Nature of a Fever conſiſts, to be its very Principle, Conſtituent, or Eſſence. Becauſe therefore a Fever is a Collection of ſome or more of ſuch Affections as are not natural to an Animal, if therefore we can diſcover what it is of thoſe Affections in every Fever which does neceſſarily depend upon, and is joined with thoſe Faults of the Blood, without which a Fever cannot ſubſiſt; we have demonſtrated that thoſe very Faults of the Blood are not only a neceſſary Condition to the Exiſtence of a Fever, but alſo that very Thing wherein the Fever conſiſts; ſo that the Thing ſought, is nothing elſe but a Fault of the Blood; and this or that Fault, determines the Fever to be of this or that Kind. Let us therefore enter upon this difficult Enquiry, ſo that it may appear, *a Fever is nothing elſe but a vitiated Blood*; which we ſhall endeavour to do, by ſhewing in particular, whatſoever muſt neceſſarily happen in every Fever from a vitiated Blood.

PROPOSITION IV.

All thoſe Things which precede a Legitimate Ephemera, *diſorder the* Motion *of the Blood.*

Becauſe Sadneſs and Fear are Affections attended with languid Motion, they occaſion a leſſer and ſlower Influx of Juice into the Nerves; and therefore by ſuch Means are the Muſcles contracted ſeldomer and weaker, the Heart partakes of the ſame Motion, and with that the Pulſe or Motion of the Blood correſponds. *Grief and Fear.*

But as Anger is attended with brisker Motion, it cauſes a greater Influx of Fluid into the Nerves, that is, more frequent and ſwift, and the Muſcles, and conſequently the Heart, con- *Anger.*

contract more frequently, more ſwiftly, and more ſtrongly; and to that anſwers a Pulſe that is ſtrong, frequent, and ſwift; and to this a correſpondent Motion of Blood.

Sollicitude. But becauſe Sollicitude of the Mind, is joined either with Grief, with Fear, or with Anger, or with Expectation that is equivalent to Fear, or Anger, it diſorders the Motion of the Blood, and the Pulſe in either of theſe Extremes, as appears from the preceding.

Watching. Watching, if it is ſuppoſed ſo protracted, as to have in great Meaſure waſted the nervous Fluid, by their Defect or Poverty, the Pulſe will become ſmall, weak, ſlow, and ſeldom, and conſequently a vitiated Motion of the Blood; or if it is continued but for a ſhort Time, ſo that the more humid Part only of the nervous Fluid is waſted, and the Remainder reduced to ſuch a Degree of Dryneſs, as to exert it ſelf with greater Energy, it then comes to paſs that the ſame Fluid, for Want of its uſual Contemperature and Humidity, diſtils from the Nerves into the Muſcles, both more frequently, and more ſtrongly inflates them, whereupon the Pulſe becomes more frequent, ſtrong, and quick; and therefore is the Blood vitiated in its Motion. The like as happens to Watching in either Caſe, alſo belongs to Intention of Mind; whether it be greater and longer, ſo as to waſt moſt Part of the nervous Fluid, or ſhorter, and carry away only its moſt humid Part. *Intenſe Thought.*

Evacuations likewiſe belong to this Head; for thoſe which are moderate may draw away only the more humid Part, and render the nervous Fluid more dry, but when in Exceſs they ſink the Spirits. But theſe do ſomething alſo on the Account of a *Stimulus*, eſpecially when they happen by Stool, or upwards; whereupon, by Way of Derivation, a greater Quantity of nervous Fluid than natural flows into the Heart, that is, as often as there is exiſting already in the Nerves univerſally ſo much, that it may by Derivation be drained into this or that particular Nerve; but if that univerſal Supply be deficient, there will not upon Derivation be drawn ſo much into any particular Nerve as a natural Quantity, but yet more than if ſuch *Stimulus* or derivative Motion was abſent. *Evacuations.*

Since therefore Pain may be conſidered as a *Stimulus*, it is manifeſt that Pain will alſo diſorder the Pulſe; and the *Stimulus* at the Heart will be greater or leſſer, in Proportion to the Proximity or Diſtance of the Nerves primarily *Buboes, eſpecially when they ſuppurate.*

marily affected; for the further they are off, the more languid is the Reflux, and conſequently will it more difficultly paſs into the Cardiac Nerve, not accuſtomed to dilate beyond its natural Capacity without Force; and the like even when the ſtimulated Nerve is nearer, in Caſe its Inclination towards the *Immiſſary* diſpoſes it to affect the *Immiſſary Nerve* with more or leſs Difficulty, that is, with more or leſs Pain. There may happen therefore a very intenſe Pain, and that not far from the Heart, which ſhall not diſorder the Pulſe; and, on the contrary, a more remiſs one in Nerves very diſtant from the Heart, which ſhall diſturb it. Since likewiſe in Suppuration there is Pain, and moreover that all Tumours, when they are upon membranous and nervous Parts, ſo as to load, extend, and draw them from their natural Poſtures, occaſion Pain, it is manifeſt that the Pulſe, and Motion of the Blood, muſt be vitiated by them; and all this muſt happen on a *Eryſipelas.* double Account in an *Eryſipelas*, becauſe that cannot happen any where, eſpecially in the finer Parts, without ſome Tumour, although ſmall, ſince the Blood continually crouds thither, and ſome of it remains behind; And yet further, the burning Heat of an *Eryſipelas*,

pelas, more ſharply vellicates, or ſtimulates the Coats of the Nerves; and all theſe Ways of ſtimulating become of greater Efficacy on thoſe extreme Parts where great Plenty of Nerves are diſtributed, and where they are very tenſe.

Labour. The Motion of the Body alſo neceſſarily vitiates the Pulſe, for that ſhakes the whole nervous Syſtem; and, as it happens in the moſt minute Canals where Water ſticks, or is but ſlowly moved, that it drops away upon Shaking, ſo their Contents which move on ſlowly, are forced hereby with *Impetus* into the Muſcles, and ſuch Efflux is rendered more frequent, than in a natural State, and more in Quantity alſo is ſhook out every Time, whence the Pulſe becomes more ſtrong, more frequent, and more ſwift, that is, the Pulſe and Motion of the Blood are diſordered.

Hunger and Thirſt. Hunger and Thirſt in Exceſs, ſuppoſe the Body already exhauſted of its natural Humidities and Spirits, whence the Pulſe becomes languid, ſlow, and ſeldom; but when theſe are not continued to Exceſs, wherein the aqueous Humidity only is waſted, and the Spirits rendered hotter, the Pulſe appears under very different and oppoſite Qualities, as hath been before ſaid of Watching.

A hot Temperament. A hot Temperament generates more lively Spirits, from whence they more frequently diſtil into the Fibres of the Heart, and in more Plenty; whence the Pulſe is more ſtrong, and more frequent, and conſequently the Motion of the Blood diſordered; the ſame is *Hot Diet.* alſo cauſed by a hot Diet, as will appear from the preceding: Alſo a *Air.* warmer Air, and a Continuance in the Sun, or by a Fire, will, by waſting that Humidity which makes a neceſſary Part of the nervous Fluid, or by rarifying, or attenuating it, or by all theſe together, occaſion the Remainder to flow through the Nerves more briskly, and to diſtil into the Fibres more copiouſly, and with greater *Impetus*, whence a Diſorder in the Blood's Motion. Somewhat analogous to this *Drunkenneſs.* will follow from Drunkenneſs, by Reaſon of the Heat which comes from the Wine; and moreover will there in this Caſe be a greater Fulneſs of the Veſſels of the *Pia Mater*, whence a greater Compreſſure, and, on this Account, a greater Diſorder of the Pulſe, and Motion of the Blood, as it appears, muſt neceſſarily happen upon every Plenitude of the Veſſels, from whatſoever Cauſe that Plenitude happens.

pens. Bathing alſo by Means of its Warmth will for the ſame Reaſon diſorder the Pulſe and Motion of the Blood; and moreover as the Water relaxes and wearies the Body, it may eaſily occaſion ſuch a Tranſpiration of the Spirits, as thence to cauſe the ſame Alterations in the Pulſe and Blood's Motion, as were before obſerved to ariſe from a Poverty and Defect of the nervous Fluid.

Hot Baths.

A Diminution of Perſpiration by Fuliginoſities, which are at that Time retained, will render the Spirits more acrid; and ſo by them, as well as the retained Humidities, will the Blood-Veſſels be more filled, whence the Preſſure upon the Brain is greater, and a Pulſe and Motion of the Blood anſwering thereunto.

A diminiſhed Perſpiration.

Crudity of every Kind, ſupplies but a little of ſuch a Juice as is neceſſary to generate Spirits, and even that is either acrid, or ſubtle, watery, or viſcid: In the firſt Caſe the Spirits will be too ſharp, and immediately exceed by their peculiar Activity that Quantity of Motion, which more conſiſtent, and leſs ſharp are Subject to in a natural State; whence the Pulſe will be more ſtrong and frequent; but by its continual Decreaſe of Quantity, will the Pulſe ſoon grow weak and ſlow,

Crudity.

which likewiſe in the ſame Manner happens, when the Promptuary, whence the nervous Fluid is ſupplied, is too viſcid and watery; becauſe ſuch a Juice contains a very ſmall Quantity of Spirit.

Sleep, Becauſe alſo Sleep moiſtens, gives a Kind of Numbneſs, and procures a greater Sluggiſhneſs in the nervous Fluid; in too long Sleep the Spirits will become loaded with ſo much Humidity, as to grow more languid, ſluggiſh, and ſcarce, and a leſs Quantity of them will fall into the Fibres of the Heart; whence the Pulſe will be weak, ſeldom, and ſlow, and alſo a like Change in the Blood's Motion; *too much.* And on the contrary by too little Sleep, as by immoderate Faſting, ſo much Humidity will be exhaled from the Spirits and Blood, as to give oppoſite Qualities to the Pulſe.

Coſtiveneſs. Laſtly, Since the *Fæces* of the Bowels by being retained too long grow hot and dry, the nervous Fluid will alſo be ſo too, both too hot and dry, or more apt to rarifie, and quicker of Motion, whence the ſame Diſorders of the Pulſe and Motion of the Blood, as was before explained to reſult from the ſame Qualities.

Retention of Urine. The Urine being retained, makes it irritate and ſtimulate very much, whence it comes under the ſame Conſideration as Pain; and therefore it appears that with all the above-enumerated Accidents there is neceſſarily joined a Diſorder in the Blood's Motion, ſo that *this* does abſolutely depend on *them:* But we muſt here obſerve, that ſince with many of the enumerated Affections there is alſo joined a Cauſe in the Blood that gives thoſe Diſorders of Pulſe and Motion, yet it is not our Buſineſs here to enter into its Examination, becauſe it concerns us here to explain only how it comes about, by Means of the abovementioned Affections, that the Motion of the Blood is diſturbed, although there were not ſubſiſting any Cauſe in the Blood, or in any Part of the Body vitiating it, but only affecting the animal Spirits in a Manner that is not natural. Wherefore the Propoſition appears to be true.

PROPOSITION V.

From the above explained Diſorder in the Motion of the Blood, does neceſſarily flow all the Concomitants *of a* Legitimate Ephemera.

Pulſe. From what hath been already ſaid, it appears upon what the Diſorders of the Pulſe does depend, and upon what Neceſſity they act in a *Legitimate Ephemera*; as well when it is ſlow, weak, and ſmall, as when more quick and ſtrong, *&c.* ſince theſe all flow from a greater or leſſer, a ſwifter or ſlower Influx of Spirits through the Nerves into the Fibres of the Heart. But becauſe ſuch Influx, whether greater or leſſer, is for the moſt Part equable, that is, its Cauſe does equably perſevere, hence muſt continue alſo the ſame Kind of Pulſe, as long as ſuch Cauſes ceaſe not to operate, and the Operation of thoſe ceaſing, the Pulſe returns to its natural State; or, which is the ſame Thing, the Pulſe will remain equably vitiated, and when the Cauſe of its Diſorder ceaſes, it will again come to its natural Meaſure.

But becauſe Reſpiration is alſo performed by the Action of Muſcles, where there is a greater Influx of nervous Fluid through the Nerves, and one that is more frequent, there likewiſe Reſpiration will be ſtronger and thicker; the like to which will alſo happen when ſuch Influx is made by Spirits of greater Energy, *&c.* but the contrary when influenced by Spirits, and other Conditions of leſſer *Moment*; but becauſe by an augmented Force of the Heart the Blood is increaſed in that Velocity and *Momentum*, whereby its own Particles, which in the Veſſels are compelled into Contact, act againſt one another; when therefore they recede from ſuch Contacts with a greater *Momentum* than natural, they will more eaſily be ſeparated, and obedient to thoſe Properties, which even with a leſſer and natural *Momentum* would part them from each other; and conſequently from an augmented Velocity of Blood will there be a greater Number of Particles ſet at Liberty, and if they can perſpire, and be perceived by the Touch, will appear to be greatly augmented in Efficacy and Quantity. *Reſpiration.*

Heat however even in the Blood's natural Velocity is ſeparable from it, perſpires, and is ſenſible to the Touch; *Heat.*

there,

therefore in an increaſed Velocity of Blood, a great Portion of it will eſcape, and perſpire, and affect the Touch more ſenſibly, or the Heat will be felt greater than natural, which either by Means of its greater *Impetus* of Motion, or Exceſs in Quantity, will prove very troubleſome to the Patient. In Proportion alſo to its Increaſe of Motion will the Heat appear more or leſs moderate and pleaſant; and if this Increaſe is really moderate, it will the more plentifully attenuate and evaporate; but it will not yet ſo far attenuate the Juices, as to render them altogether ſubtle and active, like the Particles conſtituting Heat, but they will ſo far ſtill keep their own Nature, as in their Tranſpiration with the Heat to compoſe a Mixture of both Heat and Humidity, and render the Perception of it moderate and pleaſant. For the ſame Reaſon alſo that this is the Reſult of tranſpiring a moderate Quantity of Heat, will ſuch Heat be more diffuſed and general, and not burning and unequal, like that of a more intenſe Nature, but mild and remiſs. The Increaſe likewiſe of this Heat will be equable, for ſince it owes its Riſe to a Motion equably augmented, its own Progreſs muſt alſo be attended with the like Condition.

Be-

Heat and Pain in the Head.

Becauſe therefore from an Increaſe of the Blood's Velocity, its *Moment* within the Veſſels is increaſed, and conſequently its Heat, thence alſo it comes to rarifie, whereby on another Account it comes to have a greater *Niſus* againſt the Coats of its containing Veſſels; wherefore it will diſtract them, and the Perception of ſuch Diſtraction will be chiefly upon thoſe Parts that are moſt membranous and tenſe, and ſo implicated with the Blood-Veſſels, as to give ſome Check to its Progreſs, and ſuch they are in the Head. In like Manner, as by this Implication of the Veſſels, the Blood hath not ſo free a Current through them, ſo likewiſe by the Increaſe of its *Momentum*, and the Efforts of the Heat to eſcape, there is felt not only a diſtractile and drawing Pain, but alſo a Throbbing; and from the *Niſus* of the igneous Particles againſt the Membranes, a Senſe like Pricking: The Heat alſo for the very ſame Reaſon will be moſt ſenſible about the Head, becauſe the Blood by ſuch Retardations as here mentioned will be more crowded there, and conſequently thoſe Particles be more numerous which give a greater Perception of Heat.

Urine.

But becauſe ſuch a moderate Increaſe of Heat as is here ſuppoſed, or its eaſie Eſcape from thoſe Particles of the Blood with which it was before combined, hardly vitiates the Maſs it ſelf, therefore the Secretions of its derivative Juices, and thoſe Fluids themſelves which are naturally ſtrained from it, will hardly be changed from their natural State; whence the Urine will be like that of ſound Perſons, and it will be well conditioned in Colour and Sediment. And further, becauſe with that Diſorder in the Blood's Motion which is occaſioned by its Increaſe of Quantity, there is only an Increaſe of Velocity, by Means of that increaſed Velocity thoſe groſs Parts cannot be ſeparated in the Kidneys, which give to the Urine its Colour, but only the more watery Particles, whence its Crudity and Whiteneſs; that is, in every increaſed Velocity the Urine is more crude and white, although there be not any Change of Quality in the Blood, whence ſuch Appearances might otherwiſe be derived.

Acceſſion without Cold, &c. or ſometimes a tranſient Shivering.

Since therefore by an Increaſe only of Velocity, the Blood it ſelf is not vitiated or diſordered, but in an Augmentation of its Heat, immediately upon ſuch Increaſe of Velocity will there alſo be a greater Heat, whence in the Beginning of a Paroxyſm there is no other Perception but of Heat;

and through its whole Progreſs, ſo long as the Cauſe of an augmented Quantity ſubſiſts, ſo long will the Perception of an increaſed Heat be continued. But if with the Cauſe diſordering the Blood's Motion, ſomething be joined that hinders the Separation of the Particles of Heat, or that prevents them when ſeparated from evaporating, ſo as to affect the Senſes of Feeling, then at the Beginning of ſuch a vitiated Motion of the Blood, and throughout the whole Duration of that Cauſe, whatſoever it is which thus hinders the Heats Eſcape, or Influence upon the Nerves, there will be a Perception of Cold, or ſome Degree of it, which is called Shivering, or Stiffneſs, and ſuch as is wont to happen more eſpecially in that Change which is made by Drunkenneſs, too full a Meal, Diminution of Perſpiration, and the like, which are more properly ranked amongſt thoſe Things which diſorder the Blood in Quality.

Decreaſe with Sweat, &c.

Becauſe by that Motion of the Blood whereby its Particles act againſt one another, ſome are broke from their former Combinations, the Maſs is rarified, and preſſes more forceably againſt its Veſſels; and therefore the Blood more diſtends the Coats of its Canals, and is in it ſelf more crowded, whence there is rendered a more difficult Eſcape for its fluid Parts, which otherwiſe would evaporate and breath out, and conſequently is there no Sweating in the greateſt Degree of Heat; but when that ſenſibly remits, the Membranes grow more flaccid, and the Diſtention of the Veſſels decays, the moiſt Parts get out, and appear in Sweat, and therefore is there a Diminution of the Heat with Sweat; which Sweat will reſemble that of healthful Perſons; becauſe by ſuch a moderate Augmentation of the Blood's *Momentum*, only the more lax Parts of it have been exhaled, and lie upon the Surface of the Body in a Dew, after which is reſtored a State of perfect Health; as the Cauſe which at firſt diſordered the Motion of the Heart now totally ceaſes. Since theſe therefore are the *Concomitants* of an *Ephemera*, the Propoſition appears to be true.

How the Urine in Paſſions of the Mind.

The Urine happens to be higher-coloured than natural, in ſuch Paſſions of the Mind as are either attended with a diminiſhed Velocity of Blood when more groſs Parts are ſeparated through the Kidneys with the aqueous ones, than are wont to be in a natural State, or when ſuch groſs Parts happen to be mixed with the Blood in an over-Proportion, and belong to that Claſs where the Blood is vitiated in Quality, or when the Motion of the Blood is ſo augmented, that by Exceſs of Heat the more humid Parts are exhaled and waſted; ſo that there is leſs of it to be ſeparated in the Kidneys, than is neceſſary to dilute that high Colour which ariſes from the ſolid Particles.

Pulſe and Heat in Anger.

Since Anger is accompanied with Briskneſs of Motion, it makes the Pulſe high, ſwift, and ſtrong, it evaporates much Heat and Humidity, and the Heat will be perceived more increas'd, but mild and not ſharp.

On the other Hand, Sadneſs is attended with languid Motion, and makes the Pulſe ſlow, languid, and ſmall; but little Heat eſcapes, and much leſs Moiſture, which is more difficult of Motion; whence the Heat will be felt natural, but in a lower Degree, more contracted, and leſs diffuſed. And becauſe from ſuch a ſluggiſh Motion, the Blood becomes unfit for Nouriſhment, the Body becomes emaciated, and the Eyes hollow, and from the Blood's Diſtemperature in Quality, a very ſtrange Change of the Countenance from its natural State.

Intention of Thought.

If the Intention of Thought be ſuch as makes leſs vivid Impreſſions upon the Nerves, then all thoſe Conſequences will happen as above explained of Sorrow; but on the contrary, if it excites greater Energy to Motion.

Watching. But becauſe by Means of Sleep ſuch Particles are added to the Subſtance of the Body as are fitted for its Nouriſhment; in the Time of Watching therefore ſuch are defective, or ceaſe to be ſo added; ſo much then of them as is not waſted by Perſpiration, remains in the Maſs of Blood, and gives to it a Redundance of Humours; hence the Complexion and whole Conſtitution abound with Moiſture, and conſequently a Dulneſs of the Looks, a ſlow Motion of the Eyes, and a Rheum hanging about them; although even all theſe may happen from Heat in Watching, if ſuch Watching is too long continued, ſo as to weary the Muſcles, and to relax the membranous Parts, ſo that their Humidities flow through them.

Labour and Wearineſs. In hard Labour the natural Moiſtures are exhauſted, whence a Dryneſs comes upon the whole Body, and the Skin; of which a certain Forerunner is great Thirſt, but of that Moiſture which is left, the Skin will have ſome Share, ſince it is moſt likely to paſs that Way, tho' when there is no Humidity left by Means of ſuch Motion as fuſes the Blood, as in extreme Exerciſe the Skin, will become dry.

Adſtriction of the Skin.

From Adſtriction of the Skin it becomes thicker, and more compact; whence the Paſſage of the Heat more difficult, and conſequently at the firſt Feeling it is leſs perceivable, and thought moderate; but if the Hand be continued long upon the Skin, that Heat which would otherwiſe make its Eſcape, collects in Quantity under the Hand, and enlarges the Pores, whence the ſubſequent Vapour exhales in greater Quantity, is joined with the preceding, and excites a Perception of a much more intenſe Heat. But here it is poſſible to fall into a Miſtake, that is, by confounding the Perception of the firſt Heat with the ſubſequent, and which may the more eaſily happen, becauſe a Perception of the firſt Heat continues upon the Nerves ſome Space of Time, ſo as to anticipate in ſome Meaſure a Perception of the ſubſequent Heat. The Urine in this Circumſtance comes to be higher coloured by a Retention of Fuliginoſities, or ſolid Particles; but the Body is yet not waſted, becauſe the Blood is not vitiated, and the Veſſels are not only not drained, but even over filled, from the Retention of perſpirable Matter that could not paſs through ſuch a conſtringed Surface.

Buboes. From Buboes the Pulſe comes to be affected as before explained from Pain; but from a great Increaſe of the Blood's Velocity, the Heat is alſo much increaſed, yet ſeems pleaſant to bear; yet hence when it comes much to rarifie, and thereby cannot ſuddenly fill the innumerable Capillaries, and the moſt complicated Veſſels about the Head, it collects in the larger Veſſels upon the Face, whence they become extended and bloated, and give a very high Colour to the Countenance.

Plenitude. From the very ſame Cauſes, when the Motion of the Blood and Pulſe is diſordered by Redundance, the Eyes, Face, and Urine grow higher coloured, and the Pulſe great and quick.

Duration 24 Hours. Becauſe every one of thoſe Cauſes which are able to diſorder the Pulſe may continue for more or leſs Space of Time; whenever therefore it ceaſes to produce that Effect in 24 Hours, or thereabouts, there will be a Time given by this Cauſe commenſurable to a *Legitimate Ephemera*; and from the ſame Error likewiſe are all its other *Concomitants* to be accounted for, as they have been already explained; the Truth therefore appears of the whole Propoſition.

PRO-

PROPOSITION VI.

From the above explained Diſorder in the Motion of the Blood being longer protracted, does neceſſarily follow all the Conſequences *of a* Legitimate Ephemera.

Protracted ſometimes beyond 24 Hours.

The Patient may ſweat, and yet the Cauſe diſordering the Blood's Motion continue, therefore ſuch Sweat does not proceed from the Cauſe of ſuch Diſorder, but from ſome other Cauſe whatſoever it be, and conſequently the Diſorder will be protracted into a longer Time of Exertion. There would no Sweat riſe, if the Cauſe vitiating the Blood's Motion was abſent; where therefore that does continue, and Sweat for Reaſons before given ought to appear, the diſordered Motion of the Blood will alſo remain, and be protracted beyond the Space of 24 Hours. If moreover through this whole Space the Pain in the Head continues without Ceſſation, and is longer protracted, therefore the immediate Cauſe procuring that Pain muſt alſo continue, that is, the Tenſion and Throbbing of the

Veſſels, or both of them, proceeding from too great Velocity, *Niſus*, Rarefaction, and Heat of Blood, and the Cauſe producing all theſe will be yet remaining, that is, a Blood vitiated in its Motion.

What ſucceeds ſuch Protraction.

By Means of a longer Continuance of this Error in the Blood's Motion, the Heat is more diffuſed, and all thoſe Conſequences already mentioned become neceſſarily more aggravated; and ſuch Diſorders more eſpecially will be continued, which neceſſarily depend upon a vitiated Motion in the Blood, for two, three, or four Days, or ſo long as the Cauſe vitiating its Motion continues, and hath not any Thing particular joined therewith, different from a *Legitimate Ephemera*, beſides a longer Duration, and other *Concomitants*, which are altered in no other Reſpects than in being ſomewhat more aggravated.

An Ephemera of many Days.

But if the vitiating Cauſe be yet of greater Influence, all the *Conſequences* of this Diſtemper will be yet more inflamed, ſuch as are the *Concomitants* of a *Simple Synochus*, and a *Simple Continuent*; which as they are all eaſily to be explained, and do eaſily appear from what hath already been demonſtrated in the two preceding Propoſitions, it is ſufficient to reviſe them; and from a greater Energy in the Cauſe to account

A Simple Synochus and Continuent.

count for all the Affections and Degrees of theſe Fevers.

Why theſe Fevers are either *Acmaſticæ*, that is, always of the ſame Degree of Heat; or *Epacmaſticæ*, always increaſing; or *Paracmaſticæ*, always decreaſing; in like Manner may be underſtood from the preceding. For where there is ſuch a Meaſure of Efficacy in the Cauſe vitiating the Blood's Motion, and ſuch a certain Denſity of Humours, that but juſt ſuch a Quantity of Heat can ſeparate and exhale, the Fever will be of the firſt Sort, always of the ſame Degree of Heat; but where the Quantity of Heat ſeparating from the Blood, and breathing out from thence, is always increaſing, it will be of the ſecond Kind; and where the evaporating Heat decreaſes, of the laſt Kind. But becauſe from ſuch a Reſolution of the Blood, as in this Caſe is ſuppoſed, there may reſult many other Circumſtances, which may neceſſarily give Riſe to other Diſeaſes, as well as a Fever at the ſame Time; and that theſe will eaſily appear from the Doctrine of Diſeaſes, and ſhall alſo further be explained hereafter, when we come to ſpeak of the Blood vitiated in its Qualities, and the Manner of producing a *Synochus*; for theſe Reaſons, I ſay, we ſhall not make any further Inquiry into them here, becauſe from what hath been already ſaid the Propoſition appears in all Reſpects true.

But we muſt not here omit one Circumſtance relating to an *Hectick*; becauſe the Fault of the Blood's Motion in this particular Caſe is more eſpecially aggravated, it therefore produces a more lively Heat, and a greater Power of diſſipating the natural Humidities, which it attenuates and drives away by Perſpiration; the longer therefore this Cauſe of a vitiated Motion in the Blood remains, its Dryneſs and Heat will increaſe after a very great Rate, which will alſo transfuſe into all the Solids a Heat much greater than natural, and waſte their Humidities; all which Diſorders will remain as long as the original Fault continues in the Blood; nay, although even the Cauſe which firſt brought this Diſorder into the Blood ſhould ceaſe, yet after the Blood hath obtained ſuch a dry and hot Conſtitution, the ſame Conſequences will remain, whence the Matter ſupplying the nervous Fluid will in like Manner be hotter and dryer; whence the Spirit be alſo more acrid, of greater Energy, and ruſh with greater *Impetus* into the Fibres of the Heart. This increaſed Heat moreover of the Blood will ſtimulate thoſe contractile Threads, on which Account likewiſe the Spirits will be more agitated, the Pulſe quick, a waſting of the Fleſh, a ſharp and continual Heat, which will be intended after Meals, both from an Increaſe of that Matter from whence new Heat is generated, and from the Acrimony of the already formed Blood, working the new Chyle into Heat; on which depends all the *Concomitants* of an *Hectick*; as ſhall hereafter be more particularly made appear. Here then is demonſtrated what was propoſed.

PROPOSITION VII.

A Legitimate Ephemera *is a Fault in the Motion of the Blood, produced by a diſordered Influx of a Liquid through the Nerves, into the Fibres of the Heart; and this is the* firſt *Way of generating an* Ephemera, *and after the ſame Manner may an* Ephemera *of many Days be produced.*

Becauſe a *Legitimate Ephemera* is nothing elſe than a Collection of all thoſe

Appearances which we call the *Antecedents*, *Concomitants*, and *Conſequences* of this Fever; for in the preceding Propoſitions it hath been demonſtrated, that all thoſe *Antecedents*, *Concomitants*, and *Conſequences*, do neceſſarily depend upon a Diſorder in the Motion of the Blood, which is produced from an irregular Influx of Liquid through the Nerves into the Fibres of the Heart, and therefore that diſordered Motion of the Blood is not only the Condition neceſſary to the Subſiſtance of a *Legitimate Ephemera*, but is alſo that very Thing which gives Being to all the *Antecedents* and *Conſequences* of it, in the Collection of all which together the very Eſſence of the Diſeaſe conſiſts; it therefore appears, that a *Legitimate Ephemera* is a Fault produced in the Motion of the Blood after the Manner propoſed. And becauſe an *Ephemera* of many Days is nothing elſe but a *Legitimate Ephemera* longer protracted, with all its *Antecedents*, &c. although ſometimes not ſo intenſe, or aggravated; it alſo appears, that an *Ephemera* of many Days is nothing elſe but a Fault in the Blood's Motion, only ſomewhat more than ordinarily continued from a greater Irregularity of a Fluid's Influx into the Fibres of the Heart. The whole Propoſition therefore appears to be true, and here the Manner of producing both theſe Kinds of an *Ephemera*, from a vitiated Motion of Blood, is ſaid to be the *firſt* Way of producing this Effect.

PROPOSITION VIII.

The Blood errs in Quantity, from Fulneſs or Emptineſs, and all that is reducible to thoſe two Heads; as to the latter, Hunger, Thirſt, all Exerciſe, whether of the Body or Mind, Pain, Coſtiveneſs, Retention of Urine, Evacuation; to the former, hot Meats and Drinks, Drunkenneſs, Heat of the Seaſon, Continuance by the Fire, or in the Sun, hot Baths, diminiſhed Perſpiration, too much Sleep, and a hot Temperament; Crudity belongs to both Diſtinctions: And from this Fault in the Blood's Quantity does neceſſarily depend all the Concomitants *and* Conſequences *of a* Legitimate Ephemera.

That Fulneſs or Emptineſs will vitiate the Blood in Quantity, is manifeſt from the very Import of thoſe Terms; for by Fulneſs it comes about that whatſoever is contained in the Veſſels, or the Blood, is greater in Quantity; but by Emptineſs, leſs. Hunger and Thirſt muſt therefore belong to the latter Diſtinction, ſince they grow uneaſie to us by the Conſumption of thoſe Parts out of the Blood, which are neceſſary to our Nouriſhment, or by its Diminution in Quantity; all Exerciſe, if it be of the Mind only, as that takes away a great deal of Spirits, whoſe Supply from the Blood muſt thereby be alſo much exhauſted, will be followed by Emptineſs; but if it be of the Body alſo, or of the Body alone, ſince this employs many Muſcles together, it makes a Waſte both of Spirits and Blood. To this Claſs belongs Pain, becauſe it occaſions ſuch Refluxes of the nervous Fluid as contributes to its Conſumption; and alſo the Retention of the Fæces in the Bowels, which dries up the Humidities, and the Suppreſſion of Urine as it proves a *Stimulus* by exciting Pain; in like Manner all Evacuations, for Reaſons that are obvious at firſt View. But Crudity belongs to this Diſtinction only when it is of ſuch a Nature, that the unconcocted Juices do not reach ſo far as the Blood, but ſtop in the Meſentery; for when it can arive to the Blood, it will fill the Veſſels with

Juices no ways fit for the Exigencies of the OEconomy, and only diſtend them, and encreaſe the Quantity of Blood beyond what's natural. A hot Diet will rarifie the Blood, ſo as to have the ſame Effects in diſtending the Veſſels, as if they were in Reality filled with a greater Quantity; the ſame alſo will be done by intemperate Drinking, Heat of the Seaſon, Continuance by the Fire, or in the Sun, Baths too hot, and a hot Temperament. A Diminution of Perſpiration does in Fact increaſe the remaining Quantity of Blood, by a Retention of what ought to exhale; and on this Account too much Sleep belongs to Plenitude, becauſe thoſe Parts which are unfit for Nouriſhment, and hang upon the Fibres, are by that Means not ſhook away; and moreover becauſe by too much incraſſating the Juices, and numbing the Parts, it occaſions that the whole Maſs of Humours are the leſs perſpirable and fluid, as they are leſs acted upon by the Solids: and therefore appears the firſt Part of the Propoſition.

In the ſecond Place then, I ſay, that *Pulſe.* all the *Concomitants* and *Conſequences* of a *Legitimate Ephemera* do neceſſarily depend upon the Blood's being vitiated in Quantity; and it hath been already ſhewn in the *ſecond Propoſition*, that from an increaſed Quantity of Blood does neceſſarily reſult a greater, a ſtronger, and a more quick Pulſe; and on the contrary, in a diminiſhed Quantity; both of which are obſerved to happen in a *Legitimate Ephemera.* To this it may be moreover added, that in a diminiſhed Quantity of Blood the Pulſe may be briſk and quick; that is, when the influent Spirits are hot and copious, although not ſo much as obſerved in the *fourth Propoſition* above; and when the Cauſe producing ſuch Pulſes is equable, the Pulſe will alſo be ſo too; and upon the Ceſſation of that, the Pulſe will return to its natural Meaſures; and in Proportion to its greater or leſſer Recedure from a natural Standard, will the Pulſe be more or leſs like to that of a Perſon in perfect Health.

Urine. With an increaſed or diminiſhed Quantity of Blood, will the Quantity of Urine be alſo increaſed or diminiſhed; and no other Changes will be made thereby, unleſs that in an increaſed Velocity the Colour will be ſomewhat heightened, by the Augmentation of Heat attenuating and exhaling ſome of the more humid Parts; or if the Heat is leſs, or the Blood more viſcid, an increaſed Velocity will detach off the more watery and fluid Parts, and retaining the more groſs, render the Urine more crude and white.

Heat and Pain of the Head, and whole Body.

Heat and Pain of the Head will both be more intenſe from Fulneſs, by Means of an augmented Quantity, as demonſtrated in the *fifth Propoſition*, as alſo from Exinanition, when moſt of the natural Humidities are waſted, for then there remains an over-Proportion of ſtimulating Particles; the ſame holds good alſo concerning the Heat of the whole Body.

Reſpiration.

Reſpiration is alſo as in the ſame Place obſerved, and in Plenitude or Exinanition may in Conjunction with a ſharp Diſpoſition of the Juices, be greater and thicker, than when the Motion of a Fluid through the Nerves is only irregular, and the Blood remaining in its natural Quantity; for in both theſe Caſes either more Plenty of Spirits will be ſeparated from a greater Quantity of Blood, and the Brain will be compreſſed more forceably than from a natural Quantity; and Exinanition with a ſharp Diſpoſition of the Humours, is accompanied with ſuch an Energy and Quantity of Influx, as anſwers the Deficiency of Matter, and occaſions a quicker and harder Reſpiration to follow. But this may alſo become low and faint, if ſuch Emptineſs be either very great, or if it be moderate with ſuch a Diſpoſition of Humours, as gives Spirits of leſs Energy.

Acceſſion without Cold. But becauſe it comes to the ſame Thing, whether true Blood fills up the Cavities of the Veſſels, or one that is rarified, yet when the natural Quantity rarifies, and the Cauſe ſo rarifying it begins to operate, immediately there is a Perception of Heat only, according to the *fifth Propoſition*, and no Manner of Cold or Shivering: And it happens alſo that there is no Perception of this Kind, when the Blood is diminiſhed in its Quantity, but becomes ſharper; and for the like Reaſon as there recited, does Sweat ſucceed, *Termination with Sweat.* when the Cauſe of ſuch Plenitude or Acrimony ceaſes. But this is not neceſſary in *Ephemera's* from great Exerciſe, as many Phyſicians aſſert, for the Skin will then be dry, and in ſuch as are extremely fatigued, continue ſo to its total Termination.

The other *Concomitants* are as ſhewn under the *fifth Propoſition*, and may without any Trouble be deduced from thence, or from what is here ſaid. If therefore the Cauſe vitiating the Blood's *24 Hours Duration.* Quantity continues 24 Hours, all theſe in like Manner will continue as long;

and if that Cauſe perſiſts longer in Exertion, the Heat will alſo be longer continued, as explained in the *ſixth Propoſition*; and it may be ſucceeded by an *Ephemera* of many Days, one or other Sort of the *Synochus*, a *Hectick*, &c. and all theſe conſequential Affections will be intended or remitted in Proportion to the Quantities of Blood, and its Degrees of Acrimony. Wherefore the whole Propoſition is true.

PROPOSITION IX.

A Legitimate Ephemera *is a Fault in the Quantity of Blood from Plenitude, or from Exinanition; and this is another Way of producing an* Ephemera, *and by the ſame Means may an* Ephemera *of many Days be produced.*

In like Manner as in the *eighth Propoſition*, a *Legitimate Ephemera* is nothing elſe, than a Collection of all thoſe Affections which either *precede*, are *joined with*, or *follow* it; and in that it is further demonſtrated, that all thoſe *Antecedent*, *Concomitant*, and *Subſequent* Affections, altogether depend upon a

Fault of the Blood in its Quantity, produced either from Plenitude or Exinanition; therefore that vitiated Quantity of Blood is not only the Condition without which an *Ephemera* cannot ſubſiſt, but it is the Thing it ſelf that conſtitutes its very Being, becauſe that ſame vitiated Quantity of Blood gives Riſe to all its *Antecedent*, *Concomitant*, and *Subſequent* Affections, the Collection of all which into one, conſtitutes the Eſſence of this Fever; it appears therefore, that a *Legitimate Ephemera* is the Production of a vitiated Quantity of Blood, as propoſed. But becauſe an *Ephemera* of many Days is nothing elſe than a *Legitimate Ephemera* protracted into a longer Space with *Antecedents*, &c. ſomewhat more intended, tho' not always; it alſo appears that an *Ephemera* of many Days is nothing elſe but a Diſorder in the Blood's Quantity; only ſomewhat more aggravated, from a greater or leſſer Exinanition or Plenitude. The whole Propoſition is therefore true; and this Way of bringing on an *Ephemera* of either Kind by a Blood vitiated in Quantity, is the ſecond Way.

PROPOSITION X.

All the Antecedents *to a* Legitimate Ephemera *vitiate the Blood in its Quantity.*

Grief and Fear.

Becauſe Grief and Fear are, or very probably may be, Hindrances to Motion, therefore all that while ſuch Impreſſions continue, will there be a leſs Conſumption of Spirits for ſome Time, but after longer Continuance, a much greater Quantity will be exhauſted; and therefore as their Supply is to be had from the Blood, a greater Quantity of ſuch Particles is drawn from thence: Now that Fluid paſſing thro' the Nerves is a Kind of *Lympha*; conſiſting of a more viſcid Juice, and a Spirit which is very active, and of great Energy; a greater Conſumption therefore of ſuch a Fluid will drain alſo the Blood of its moſt viſcid and moſt active Parts together, and conſequently will render the Remainder both more looſe in Texture, and leſs diſpoſed to Motion; that is, it will be changed and vitiated in Quality.

Other Affections of the Mind.

But this will more eaſily happen in other Affections of the Mind, that are of greater Energy, for ſuch will not only waſte a great deal of Spirits by their ſole Properties, but by being accompanied with violent Motions of the Muſcles for the moſt Part, eſpecially in Anger, that in the Solids, and even in the whole Maſs of Blood, will be exhaled, whence the Blood will grow more hot, and from a Conſumption of its Moiſtures, grow harſher and dryer; that is, the Blood's Quality will be changed.

Watching.

The ſame is cauſed by too much Watching, and that on a double Account; firſt of all through an over-Quantity of Spirits, which in protracted Watching is elaborated from the Blood, whence the Remainder is left colder and moiſter than it otherwiſe would be; and ſecondly, becauſe in Watching a great deal of Moiſture is exhauſted from the ſolid Parts, which they muſt again immediately draw from the Blood, and render it dryer; which yet is the more eaſily brought about by an Evaporation of the hotter Particles, whence the Blood being robbed of its Principles of Motion, becomes more chill and dryer, through too great Expence of Moiſture, all which happen in long Watching; but after a more moderate Manner, in leſs protracted Watchings;

ings; whence in both Circumſtances the Blood is more or leſs vitiated in its Quality.

Exerciſe. Exerciſe of the Body waſtes its Moiſtures and Spirits, whence by Means of that Humidity which is drawn from the Blood, the Remainder is left more ſharp and active; but if ſuch Exerciſe is protracted and vehement, inſomuch as to waſt the greateſt Part of the Spirits, the Blood will be yet more dry; which then containing but a ſmall Portion of active Particles that cannot extricate themſelves into Action, it will conſequently become both colder and dryer; but if ſuch Exerciſe is more remiſs, and ſhorter, it will then become hotter and dryer.

Evacuation and Pain. But becauſe all Pain contracts, and every Contraction preſſes out of the Arteries and other Veſſels what is moſt fluid, therefore by Pain the more watery Parts of the Blood will be diſcharged, with others of greateſt Fluxility; whence what remains in the Veſſels will be dryer, of a fiery and earthy Nature, and they will be in more Liberty for Action, whence the Blood will be more vivid and dry. The ſame is alſo the Effect of Evacuation, when they are procured by ſtimulating; to which Claſs are reducible Buboes, Inflammations, Retention of Urine, and Stools; for when the Fæces of the Bowels are ſome Time retained, they grow dry, and abſorb Moiſture from the Blood.

Hunger and Thirſt. Hunger and Thirſt ſuppoſe the Blood vitiated in Quality, and they will ſtill encreaſe ſuch Diſorder the longer they are continued; for it is certain that under ſuch Circumſtances there will be wanting what is neceſſary to repair the Blood's Loſs, *viz.* a balſamick Moiſture, ſuch as Lymph and Spirits, whereupon the Maſs becomes a Kind of courſe Recrement, and earthy.

All hot Things. Becauſe Heat increaſes by an Increaſe of Motion in the Body, and the Veſſels grow tumid, as likewiſe doth the ſame happen from adventitious Heat, of the Fire, and the like; by ſuch Heat the Blood rarifies, and is thereby more diſpoſed for Reception of it; whether it be therefore from a hot Temperament, or Seaſon, or Bath, or Diet, or Drinking, or a ſulphureous Crudity that partakes of a great deal of Heat, or Suppreſſion of Perſpiration of what is of a fuliginous Nature, like dry Smoak, that is ſulphureous and hot, the Blood obtains a greater Share of Heat, and rarifies, and is therefore altered in Quality. *Inflammation.* This Effect will an Inflammation, upon the extreme Parts more eſpecially, have, as that is attended with an uncommon Fervor of Blood in a particular Part, which is eaſily communicated in a little Time to the whole Maſs.

Plenitude. This alſo may be the Effect of Plenitude; for as this already ſuppoſes a greater Quantity of Blood in the Veſſels than natural, its Particles will be more crowded againſt one another, whereby they will preſs out or diffuſe its Heat, and the whole Maſs will grow hotter, rarifie, and exhale its humid Parts. But yet an obſtructed Perſpiration will more readily contribute to this Rarifaction, Exſiccation, and Augmentation of Heat; whether the perſpirable Matter lodges in the capillary Veſſels, and thereby ſtraitens the Blood's Circuit, ſo as to produce the Concomitants of a Plethora; or whether the ſucceeding perſpirable Matter, either from the ſolid Parts, or Blood it ſelf, does alſo hinder its Evaporation, and accumulate therewith in the Veſſels, whence the Blood grows hotter, dryer, and more rarified. *Obſtructed Perſpiration.*

Crudity. Further, a ſulphureous Crudity joined with Heat will dry and heat the Blood; but ſince it is taken for granted that Crudity is accompanied with indigeſted Humours, that is, ſuch as are groſs, and not eaſie to be diſſolved, when ſuch are introduced into the Blood, the whole Compoſition will partake of their Nature, become leſs fluid, more thick, and compact; and a bare Crudity will do all this by its ſole Properties; but when it is deſtitute of all Heat, it renders the Blood more viſcid and cold, like Glue, Slime, or Gelly.

Again, Plenitude and an obſtructed Perſpiration, although they are not ſuppoſed to excite, and raiſe a greater Quantity of Heat, yet on this Account they vitiate the Blood in Quality, by deſtroying that Meaſure of Fluxility as is requiſite to its natural State in the Veſſels, as all Obſtruction and Fulneſs muſt croud them, and render their Contents thicker.

Sleep. But becauſe in Sleep a great deal is taken from the Blood of a balſamick Nature for Nouriſhment of the Parts, therefore on that Account does Sleep leave the Blood dryer and hotter. Again, becauſe from the ſame Parts a Sort of aqueous Moiſture does riſe, which cannot be excluded the Body during its Inactivity in Sleep, but is again abſorbed by the Blood, from which in the mean time Spirits do evaporate, a great Part of this comes to mix with the nervous Fluid, and by Reaſon of its feeble Energy give but very little Motion to the Parts it ſhould invigorate; whence the Blood by too much Sleep will grow more moiſt and cold than natural.

PRO-

PROPOSITION XI.

From theſe Faults of the Blood in Quality do neceſſarily flow all the Concomitant *and* Subſequent *Affections of a* Legitimate Ephemera.

Becauſe from Paſſions of leaſt Energy, or ſuch as ſlacken the natural Motions, the Blood becomes ſluggiſh, and ſends but a ſmall Quantity of Spirits through the Nerves and Arteries, therefore a leſs Quantity of Blood and Spirits will go to the Heart, and conſequently the Pulſe become ſlow, ſmall, and languid. Again, becauſe the Blood is in ſome Meaſure fuſed, but hath yet little Heat, it cannot tranſpire very plentifully, and that which does perſpire will be in Separation from ſuch Parts as ſhould contemporate its Acrimony, and conſequently will it ſeem ſharp. *From Grief,* &c. *How the Pulſe and Heat.*

For this very Reaſon, that is, from ſuch a Solution of the Blood that it becomes more ſluggiſh and cold, it comes about that the Body cannot be nouriſhed by Juices preternaturally diſpoſed, whence all the Parts will waſte by the Eſcape of thoſe Particles which have *Leanneſs and Hollowneſs of the Eyes.*

have been Nouriſhment, and for want of a new, or a ſufficient Supply; hence the Eyes will ſink inwards, for want of Nouriſhment to fill up their Cavities, and to prevent ſuch an Appearance.

Urine. The Urine will be cruder for want of due Motion in the Blood, and a leſſer contractile Force in the Membranes, whereby it comes about that the moſt liquid Part only is ſeparated, and flows out; and if the Humours obtain alſo a greater Dryneſs, the Urine may then be leſſer in Quantity, and much higher coloured.

Its Acceſſion, The Acceſſion will be without any at all, or but with a ſlight Perception of Cold, becauſe the fuſed State of the Blood cannot confine the Particles of Heat; and if it can do ſo for a very ſhort Space of Time, (in the Manner as ſhall hereafter be explained) there will be a very ſhort and tranſient Shivering.

Termination, Its Termination in like Manner will be without any Eruption of Humidity upon the Skin, if either the Blood hath contracted the higheſt Degree of Dryneſs, or if all its humid Parts are ſo attenuated in the Fever it ſelf by Motion, as to fly away by Perſpiration.

and Duration. If therefore this Conſtitution of Blood continues for 24 Hours, and then returns to its natural State, there will ſo long be a Fever, or there will be joined with this Diſorder in the Quality of the Blood, all the *Concomitants* of a *legitimate Ephemera*; but if it be longer protracted, all thoſe Affections which neceſſarily depend upon it will likewiſe be protracted.

From Anger, &c.

But becauſe from Paſſions or Affections of the Mind of greater Energy, there is made a greater and more frequent Influx of Spirits through the Nerves to the Heart, and the Blood is rendered dryer and ſharper, therefore the nervous Fluid and Blood will paſs through the Heart faſter and in greater Quantity, and the Pulſe will be greater, quicker, and ſtronger.

How the Pulſe and Heat.

The Heat, in Proportion to its different Degrees, renders the Blood more or leſs humid, and more or leſs able to reſtrain and contemperate its Energy, and therefore will it be more or leſs, ſharper or heavier, more ſparing, more plentiful, more mild, or more pungent. The like will hold as to the Urine, for the greater, the more active, and efficacious the Heat is, that will be in leſs Quantity and higher coloured; or if Humidity more abounds, in more Plenty, more thin and crude; in the firſt Caſe, becauſe the Intention and Activity of the Heat hath waſted a

Urine.

great deal of the natural Moiſtures, and of what remains all will not be ſeparated; and therefore thoſe ſolid Particles which are ſecerned with the Urine, will be in greater Quantity than can be diluted by ſo ſmall a Portion of Fluid; but if Humidity does abound, a great deal of it muſt be ſeparated in ſuch an accelerated Velocity; but of the more ſolid Particles, which require a leſs Degree of Motion for their Separation, but very little; whence the Urine is more copious, more watery, and more crude.

Acceſſion. Under this Species of Paſſion likewiſe, the Acceſſion muſt be without any Perception of Cold, if we have Regard only to the greater Energy of a free Heat; but if the remaining dry Parts can in any Manner reſtrain its Exertion but for a ſmall Space of Time, or of themſelves impreſs a greater Motion upon the Nerves than the Heat it ſelf can do, as it paſſes out of the Body, there may be excited a ſmall Perception of Chillineſs, which will very ſuddenly again vaniſh.

Deceſſion and Duration. Its Deceſſion as above, either with or without Sweat; and as this Fault in the Blood continues 24 Hours, or longer, will all thoſe Affections as uſual be of the ſame Duration.

From the whole it demonſtratively appears, that the *Concomitant* Affections of a *Legitimate Ephemera*, do neceſſarily depend upon thoſe Diſorders of the Blood in Quality as have been here recited, and which we have ſhewn to proceed from Watching, and other Accidents, even to Obſtruction of Perſpiration; for in every one of theſe the Meaſure of Cohæſion between the conſtituent Particles of Blood is vitiated, and upon ſuch Defect while ſomewhat is looſened from them which exerts it ſelf more than in a natural State, others in the mean time may operate variouſly; all which, according to the Method of reaſoning obſerved both here and in the preceding Propoſitions, will eaſily conduct us into the Knowledge of whatſoever belongs to the *Concomitants* of a *Legitimate Ephemera*, neceſſarily ariſing from the ſame Cauſes.

From Diminution of Perſpiration.

But if a Diminution of Perſpiration be looked upon as ſomewhat cauſing Plenitude, it will neceſſarily produce all thoſe Effects mentioned concerning a *Legitimate Ephemera*, in the *eighth* Propoſition; but if as leaving a dryer Conſtitution of Humours, mixed at the ſame Time with Sulphur enough to give a greater Heat to the Blood, there will be a more copious and brisk Influx of Spirits through the Nerves, and the Pulſe

How the Pulſe.

Pulſe will be greater, ſtronger, and quicker. The Skin being obſtructed, *Heat.* leſs Heat will be able to get through it, whence upon a ſhort and ſlight Touch it will appear to be but little, but upon a longer Continuation of the Hand upon the Patient, by a continual Increaſe of igneous Particles at the Surface, the Heat will grow more intenſe, and by the additional Property *Urine.* of Dryneſs ſeem very ſharp. The Urine, for Want of a ſufficient Moiſture to dilute the groſſer Particles, will appear high-coloured, and by Reaſon of a greater Motion and Heat during the Fit, but ſmall in Quantity; but on its Declenſion it will be more copious, eſpecially if the retained perſpirable Matter can be diverted that Way, by a Diminution, for Inſtance, of that Velocity, which had propelled the Matter ſuited to go off by Urine beyond its proper Outlets, into the Extremities of the Arteries; and this ſeems to be the *Sweat.* very Neceſſity why Sweat, when the Matter to make it is in Readineſs, breaks out in the Declention, becauſe then there being a Retardation of the Blood's direct Velocity through the Arteries, there is Time given for its lateral Seceſſion out of the common Current, into thoſe oblique Canals deſtined for its Separation.

When therefore a Diminution of Perſpiration cauſes Fulneſs, although the Body during ſuch a ſhort Space as a 24 Hours Fever, is very little, or not at all nouriſhed, its Decreaſe will not be apparent to the Senſes, which otherwiſe might be perceived upon a Defect of Nouriſhment; for the obſtructed perſpirable Matter keeps up a Diſtention of the Parts equivalent to true Nouriſhment, and on that Account prevents Extenuation, and the Eyes from ſinking in hollow. Its Acceſſion may alſo under this Circumſtance be without any Perception of Cold, if the Diminution of Perſpiration hath nothing joined with it that can hinder the Diffuſion of Heat; or there will be but a very ſlight Perception of Cold if the Heat is in ſome Meaſure reſtrained, if the Nerves are yet invigorated with as much Motion as at other Times; and this will continue for one Day or more, in Proportion to the Duration of the primary Diſorder.

From Crudity.

What hath been ſaid about an obſtructed Perſpiration, may be eaſily applied to Crudity, and the other *Antecedent* Affections, whence appears the firſt Part of this Propoſition; for what belongs in general to an *Ephemera*, as difficult Reſpiration, Pain in the Head, *&c.* they will eaſily be underſtood, partly ly from the Mechaniſm of the animal Operations, partly from particular Diſeaſes, and partly from what hath been already ſaid above; but from all theſe Deviations of Nature does neceſſarily ariſe the *Subſequent* Affections of a *Legitimate Ephemera*, as will eaſily appear from what hath been ſaid in the *ſixth* Propoſition; therefore the whole of this ſtands demonſtrated for Truth.

PROPOSITION XII.

A Legitimate Ephemera *is a Fault in the Quality of the Blood, and that manifold, as the Qualities of the Blood have in the two* preceding Propoſitions *been ſhewed to ariſe many Ways: whatſoever other Ways there are of producing an* Ephemera, *may by the ſame Means produce an* Ephemera *of many Days.*

The Demonſtration of this depends upon the ſame, as in the *ſeventh* and *ninth* Propoſitions.

PROPOSITION XIII.

A Legitimate Ephemera *is a Fault in the Motion, Quality, or Quantity of the Blood, or in ſome or all of theſe, continuing for one Day, from their reſpective Cauſes; but an* Ephemera *of many Days is that very Fault protracted for a longer Space of Time.*

Becauſe the Blood cannot be vitiated but in its Motion, Quality, or Quantity, or in ſome, or all of theſe, and there is no Fever without ſome Diſorder of the Blood; therefore there cannot be an *Ephemera* in which the Quantity, Quality, or Motion of the Blood is not vitiated, or ſome or all of them: but every *Ephemera* is nothing elſe than a Collection of all its *Antecedent*, *Concomitant*, and *Subſequent* Affections, and this Combination we have not only ſhewn to belong to all the recited Diſorders of the Blood, but to depend neceſſarily upon them even in a *Legitimate Ephemera*, ſo as to protract it for 24 Hours Space, but in an *Ephemera* of many Days to a longer Time; both Kinds therefore of an *Ephemera* cannot only not ſubſiſt without the recited Diſorders of Blood, but in thoſe very Diſorders conſiſts their very Nature, and conſtitutive Eſſence, and therefore a *Legitimate Ephemera* is a Diſorder of the Blood in Motion, Quantity, or Quality, or in ſome or all of theſe, (for it eaſily appears from the foregoing, that the nervous Fluid may be primarily vitiated, or that the Motion of the Blood may be primarily vitiated; and that it may be vitiated in Quantity and Quality; or in Motion and Quality, *&c.*) continuing for one Day from their reſpective Cauſes; but an *Ephemera* of many Days, is the ſame Fault protracted for a longer Time, which was to be demonſtrated.

PROPOSITION XIV.

Whatſoever does precede a Simple *or a* Continent Synochus, *does vitiate the Blood in Motion, Quantity, or Quality, and from this Fault do neceſſarily reſult all the* Concomitant *and* Subſequent *Affections of both Kinds.*

The Antecedents *in a* Simple Synochus.

Since all the *Antecedents* to a *Simple Synochus*, are the ſame as to an *Ephemera*, and it appears from the preceding Propoſitions, that all theſe vitiate the Blood in Motion, Quantity, or Quality, the firſt Part of *this* that regards a *Simple Synochus* muſt be true; even as it is reſtrained by Phyſicians to that Diſtinction only as comes from Plenitude; but ſuch a Reſtriction is not juſt, ſince all its Affections alſo ſubſiſt with the Motion and Qualities of the Blood being primarily vitiated: But although that ſhould be allowed, it yet appears from the *Antecedents*, that the Blood may be primarily vitiated both in Quantity and Quality; thus a diminiſhed Perſpiration not only fills the Blood-Veſſels, or diſorders the Blood's Quantity, but it alſo may happen that in a leſſer Degree of ſuch Diminution, the Heat of the Blood may likewiſe be intended, and all thoſe Affections produced which neceſſarily accompany a *Synochus*; thus the Suppreſſion of hot Exhalations, the Hemorrhoids, Menſes, and all *Antecedents* which increaſe the Blood's Quantity, both add to its Heat, and generate Spirits of greater Energy; and whether or no the Fault is from an increaſed Quantity of Blood, a vitiated Quality, or a Motion vitiated primarily from a Fault in the Spirits, the Truth of the Propoſition is equally certain.

Antecedents *to a* Synochus continens.

In like Manner as the *Antecedents* to a *Synochus continens*, are altogether the ſame as to a *Synochus ſimplex*, the Motion, Quantity, and Quality of the Blood will by them be vitiated; and all thoſe which have been recited further than in a *Simple Synochus*, as hard Labour and Exerciſe, vexing Cares, *&c.* will be accounted for by what hath been explained amongſt the *Antecedents* to a *Legitimate Ephemera.* Obſtructions alſo of the Skin, Liver, and other Parts, in the ſame Manner likewiſe diſorder the Blood in Motion, Quantity, or Quality, as does a Diminution or Obſtruction of Tranſpiration; all the *Antecedents* therefore to both Kinds of a *Synochus* vitiate the Blood in Motion, Quantity, or Quality, as laid down in the Propoſition.

Concomitants *of a* Simple Synochus.

Since further the *Concomitants* of a *Simple Synochus*, are the ſame as with an *Ephemera*, but more diſtinguiſhable and aggravated, it appears that they all depend upon the ſame Cauſes, but operating with more Energy, *viz.* a greater Influx of Fluid through the Nerves, a greater Augmentation in the Quantity of Blood (ſince a diminiſhed Quantity has nothing to do here), or a greater Change in its Quality, that is, more fuſed and inflamed. But as all theſe may eaſily be recollected from their own Appearances, as well as from what hath been already ſaid, and more eſpecially if the Cauſe be according to moſt Phyſicians aſſigned to a *Plethora* only, we ſhall not be any more particular thereupon. But as the ſame Things may happen from the nervous Fluid being firſt in Fault, ſo as to impreſs a greater *Impetus* of the Blood through the Heart, and greatly to rarifie it; all the ſame Affections may then enſue, and in the ſame Manner, as from the Blood primarily vitiated, when it is greatly heat; for the whole Body will look red, and be as it were blown up by a rarified Blood, the Veins will be turgid, and the Veſſels extended on all Sides from an univerſal *Niſus* of the Blood againſt them outwards; hence the Paſſages into the muſculous Fibres will be cloſed, whereby they cannot be contacted, that is, there will be Inaptitude to Motion; the Head will be pained from a Compreſſion of the diſtended Arteries; Reſpiration muſt be alſo difficult and frequent, by a continual Tenſion of the membranous Parts from the Pain in the Head, and a greater Protruſion of Blood through the Lungs. Sleep will, or ſeem to, be more deep, for the ſame Reaſon, and Images of Red, (if Relations are true) having Reſemblance to the Colour of Blood, continually floating through the Imagination; the Temples will beat from the Blood crowding through their Arteries; the Breaſt will ſeem ſqueezed and contracted; and the Uneaſineſs of ſuch Compreſſion and Heat, render the whole Body very reſtleſs: But when the preſervatory Cauſe of the Fever comes to be weakened or diluted, ſo that it breaks through in Sweat, or in ſuch Hemorrhages as cool the Blood, leſſen its Quantity, and give more Room for the Remainder, that it may rarifie without Diſtention of the Veſſels, then the Fever will terminate. All the reſt may be underſtood from a *Legitimate Ephemera*, and what hath been more particularly ſaid in the *ſixth* Propoſition, in the Explication of an *Acmaſtica*, *Paracmaſtica*, and an *Epacmaſtica*.

Concomitants *of a* Synochus continens.

The *Concomitants* of a *Synochus continens*, appear only to be in a more aggravated Degree, and therefore depend upon the ſame Cauſes operating with more Energy; and their Neceſſity of ſo doing may be underſtood from what hath been already explained. As the Heat herein is more intenſe, it will more dry the ſolid Parts, and thin and evaporate the Humidities of the Blood; whence both Liquids and Solids will be exhauſted of their ſufficient Moiſtures, and as the Heat is more intenſe, a Neceſſity alſo of Watching. In like Manner if from the ſame Cauſe that Humidity is evaporated that ſhould paſs into Spittle, there will be a Dryneſs of the Mouth only; but if that which ſhould moiſten the internal Parts, then the Patient will be thoroughly thirſty; the ſame of which will likewiſe happen if the Blood is clogged with Viſcidities, or any groſs Matter that obſtructs thoſe Veſſels deſtined for the Separation of Moiſture.

A Shortneſs of Breath, and Difficulty of Reſpiration, will alſo ariſe, for the ſame Reaſon as in a *Simple Synochus.* But if, by the Motion and Heat of the Blood, theſe Humours, which are ſeparated from it, and carried into the Cavity of the Stomach and Inteſtines, can, when they are mixed, ferment, froth up into Bubbles, and then ſuddenly burſt with Force, the Belly during their Formation will ſwell, and when they break away, will make a Noiſe: But when the Humours which are ſeparated at the Glands of the Skin, obtain alſo a Power of fermenting, they will irritate the Fibres, and generate little Blotches of a Diverſity in Colour, according to the Diſpoſitions of ſuch Humours, and become livid, black, *&c.* and Humours will eaſily ferment, when they ſtagnate from Obſtruction; and the Canals will eaſily obſtruct when the Blood is either too viſcid, or crowded too faſt in its Motion. Both theſe Kinds of a *Synochus* will laſt ſo long as the preſervatory Cauſe ſubſiſts, and that may be for three, four, or ſeven Days in a *Simple Synochus*; and in a *Synochus continens*, as it already appears by Obſervation, from ſeven to fourteen Days.

Duration.

Conſequences *to a* Simple Synochus.

From the ſame Diſorders of the Blood do in like Manner ariſe all the *Conſequences* of a *Simple Synochus*, as after a *Legitimate Ephemera*, as may appear from what hath been already ſaid: But if the Fault of the Blood be by its Increaſe in Quantity, that can in no wiſe be diminiſhed by Art, all thoſe Affections will enſue which depend upon an augmented Quantity of the Blood; and from an augmented Quantity joined with an aggravated Heat, will it happen as already obſerved of a *Legitimate Ephemera* paſſing into a *Simple Synochus*; and theſe Inflammations will be moſt conſiderable in thoſe Parts where the Heat of the Blood is moſt intenſe, and its Afflux very great, as in the Lungs; or where its Motion is much retarded, as about the Throat, within the Skull, and the

Pleura, &c. on which Account do eaſily ariſe a Peripneumony, a Pleuriſie, a Quinſie, a Phrenſie, or any other Diſtemper that hath its Riſe from an augmented Quantity of Blood, and an Increaſe of Heat conjointly.

Conſequences *to a* Synochus continens.

Theſe in like Manner do ſucceed a *Synochus continens*, as alſo an Hemorrhage at the Noſe, or any other Parts of the Body where the Blood is too much accumulated, or occaſions too much Irritation, ſo that it at laſt breaks thro' the Veſſels, or ſo diſtends them as to ouze through their Pores: An Aſthma likewiſe, as obſerved in the foregoing *Propoſitions*: An Itching, and Defluxion from the Noſe, cauſed by the ſame Protruſion and Eroſion of Blood: A Dimneſs of Sight from ſo great a Crowd of Blood compreſſing the Nerves, that due Flux and Reflux cannot be made through them, or ſo ſtraitening the Humours of the Eyes, that through them cannot paſs the Species of Objects; or by Reaſon of Viſcidities in like Manner obſtructing the Nerves, or preventing due Influx of Fluid into them: Flaſhing before the Eyes, either from lucid Species occaſioned by a greater *Impetus* of Blood, or from Light ſeparated from the Blood within the Eye by too great a

Preſſure, as it is wont to happen when we forceably ſhut the Eyes.

Paſſes into a Cauſus. Further, becauſe a *Cauſus* is nothing but a more aggravated *Synochus*, as it will eaſily appear by comparing the *Antecedent*, *Concomitant*, and *Subſequent* Affections hitherto explained, and as it will be immediately demonſtrated; therefore a more protracted *Synochus*, that is, a *Synochus* with greater Aggravations will eaſily paſs into a *Cauſus*. In the laſt Place a crude Urine, about the Beginning, is an Argument that ſuch a Solution of the Blood as is made in that Velocity, is leſs ſuited for the Separation of thoſe Parts which are capable of an oblique Seceſſion, or ſuch as are groſs, and unapt for Motion, whence the moſt fluid only get through; and as ſuch are with Difficulty comminuted, they eaſily make Obſtructions, and therefore a yet more crude Urine denotes Death; but a red and a thick one Health, becauſe with that are expelled alſo the thicker Parts, broke by the Force of Circulation, fine enough for Ejectment. The Propoſition is therefore demonſtrated.

PROPOSITION XV.

A Simple Synochus *is a Fault in the Motion, Quantity, or Quality of the Blood; or in ſome or all of theſe; produced from the ſame Cauſes as a* Legitimate Ephemera, *but ſomewhat more aggravated, and operating for a longer Time: And a* Synochus continens *is that very Fault, but ariſing from more aggravated Cauſes.*

All this is manifeſt from the preceding *Propoſitions*, if the Demonſtration be conducted as in the *ſeventh* and *ninth*; and from all together it is put out of Queſtion, that a *Simple Synochus* is nothing elſe but a more aggravated *Ephemera* of many Days; and that a *Synochus continens* is alſo an *Ephemera* of many Days, but more intended than a *Simple Synochus*; and that both theſe Kinds are to be brought about by as many Ways as an *Ephemera* of one or more Days; which was to be demonſtrated.

PROPOSITION XVI.

All thoſe Things which precede *a* Cauſus, *or a burning Fever, vitiate the Blood in Motion, Quantity, or Quality, and upon the ſame Fault do neceſſarily depend its* Concomitant *and* Subſequent *Affections. What a* Cauſus *is.*

Antecedents. Although it may appear to all who turn back to the *Antecedents* of a *Cauſus*, that from them is produced a Fuſion in the more humid Parts of the Blood, with their Evaporation and Conſumption, ſo that the Blood is more ſtrictly ſaid to be vitiated in Quality; yet becauſe from the ſame *Antecedents*, as appears from our Explanation of the *Antecedents* to an *Ephemera*, the Influx of Spirits through the Nerves may primarily be vitiated, and by a Conſumption of Humidity the Quantity of Blood may be leſſened; and that whether the Influx of the nervous Fluid into the Fibres of the Heart, or the Quantity, or Quality of Blood, are primarily vitiated, and the Fever ariſes from this or that immediate and preſervative Cauſe, it is manifeſt that the *Antecedents* to this Fever ought to be conſidered in every Capacity of Exertion wherein they are able to vitiate either of theſe Conditions in the Blood. And it may be ſufficient to hint this only here, becauſe the Exiſtence of ſuch *Antecedents*, and the Manner of their Operation in vitiating the Blood, either in Motion, Quantity, or Quality, will appear from what hath been ſaid concerning an *Ephemera*.

Concomitants.

Since therefore whether the Motion, Quantity, or Quality of the Blood be primarily vitiated, this is one moſt conſtant Effect that its Humidity is waſted; therefore will there remain a greater, more free, and a more active Heat, reſtrained by no cold or viſcid Humours; whence it will exert it ſelf on every Side with the greateſt Energy againſt the ſenſible Fibres of the Patient, or any other Perſon feeling him, inſomuch that it will ſeem even to burn the Fleſh for Want of Humidity to contemper it. Since alſo the whole Maſs of Blood partakes of the ſame Quality, it will always communicate the ſame Perception of Heat, whence there will not be felt any Exacerbation; or if at ſometimes there is a ſmall Variation, neither the Patient, nor any other Perſon,

Burning heat.

Without Exacerbation.

ſon, will be able to diſcern it, ſince it will be ſo extremely little in Compariſon to that continual Heat, which is always intenſe and burning.

Thirſt,

The Thirſt is likewiſe inextinguiſhable, and will be in the higheſt Degree aggravated, not only in the Mouth, but throughout the whole Body, ſo as to produce a Senſe of total Dryneſs; which will alſo continue becauſe the intenſe Heat exhales all the Liquids that are taken in, or ſuffers that to ſtrain through the Body, which otherwiſe would lodge therein, by the conſtituent Particles of the animal Juices being entirely broke in their natural Cohæſions, and in the higheſt Degree of Solution. Hence in like Manner is the Tongue dry and rough; dry for Want of Moiſture, but rough by the Hardneſs of the *Papillæ* which cover its Surface; for when theſe are deſtitute of their proper Moiſtures, they grow ſtiff, and disjoined in their Points, whereby they ſeem to the Finger ſharp and pungent, as when it is drawn over the Teeth of a Comb. It looks black, becauſe by Means of its great Dryneſs the ſolid Parts cannot contract, ſo as to move the conſtituent Fibres, whence the Particles of Blood, and thoſe the moſt dry too, have the leſs Motion, and in a Manner ſtagnate near the

and dry, black Tongue.

Superficies, where the more fluid Parts of Heat exhale through; and as theſe are tinged with a deep red, when they are accumulated and crowded together they will appear black.

Gnawing in the Belly. Further, ſince the Blood is thus ſharp, and the Heat ſo liberal, the Juices alſo which are naturally derived into the Inteſtines, will alſo be ſharper, and leſs yielding, or more at Liberty for Action and Efficacy; whence the Nerves of the Stomach and Inteſtines will be more ſharply vellicated, and a Senſe of gnawing occaſioned in the Belly: *Black Stools.* And becauſe the Stools are tinged with Bile, the more this hath a Mixture of an aqueous Humidity, it will be the more yellow and diluted; but the more it is deprived of it, the more deep will its Colour be, and inclining to greeniſh or black; in ſuch a Diſpoſition therefore of the Blood, where almoſt all Moiſture is wanting, the Bile muſt alſo be ſeparated extremely aduſt, or tending towards a black Colour.

Watching. It is certain alſo that Watching depends upon the ſame Heat and Dryneſs, ſince Sleep requires that there ſhould be ſome Moiſture in the Juices, which is at that Time to be added to the Nouriſhment of the Parts, whence a Privation of Senſe; that therefore does not happen, when ſuch Addition cannot be made, and it cannot be made, when there ſubſiſts no Humour to be added.

Deprivation of the Underſtanding.

Deprivation of the Underſtanding is a *Concomitant* of this Fever, either becauſe the Nerves being too tenſe from a more than natural Heat and Dryneſs, cannot excite ſuch Tremors as where the Underſtanding is right; that is, they excite none, or not all, or thoſe not regularly; or becauſe from too much Heat and Dryneſs of the Blood, the Spirits generated are too vivid and perſpirable, ſo that in their Paſſage they have not ſufficient *Impetus* againſt the Membranes or Coats of the Nerves; or becauſe thoſe Spirits are deſtitute of their aqueous Vehicle, whence they do not adequately fill the nervous Canals, nor make the Impreſſions of any Species forceably enough to be perceived, and conveyed along thoſe minute Paſſages; or any other like poſſible Cauſes, comporting with the Laws of the OEconomy.

Reſpiration difficult, &c.

Reſpiration is rendered difficult by too great a Protruſion of Blood upon the Lungs, which in the preſent Circumſtance being alſo very hot, greatly rarifies therein, and diſtends them on all Sides, whence the Ramifications of the Wind-Pipe unfold or open with much more Difficulty, to remove ſuch an increaſed Preſſure; and hence alſo to get rid of that uneaſie Senſation of Heat and Tenſion, we ſtrive to breath oftner, which likewiſe without our Endeavour will happen, by Means of the Sharpneſs and Activity of the Blood and Spirits, oftner diſtilling into the Fibres and Muſcles which act in Reſpiration: And in Regard to the Force of Reſpiration, it will be very great, both by Reaſon of ſuch an Influx which more ſtrongly contracts the Muſcles, and diſtends the Breaſt to a greater Capacity, and makes a greater Reſpiration, and by the Aſſiſtance of an Endeavour to enlarge the Reſpiration, in drawing in as much Air as poſſible, in Hopes to remove that troubleſome Senſation upon the Lungs, which is ſeated in the Blood-Veſſels.

Breathing with the Mouth open.

Continual Breathing with the Mouth open, in Order to force out, if poſſible, that inward Heat, and to give more Room for the Ingreſs of cool Air; or to remove that troubleſome Senſation of a Preſſure upon the Lungs, or to receive more conveniently a Refrigeratory from the external Air, to aſſwage that which to the Patient really is, or ſeems, hot to the very Bottom of the Lungs. But this may likewiſe happen from a Convulſion of the digaſtrick

Muſcle, as it appears from the Nature of a Convulſion, which will continually or alternately draw the Mouth open, as ſuch Convulſion is continual or alternate.

Inquietude. The Body will be alſo reſtleſs, and toſs up and down in Bed, either by Means of convulſive Contractions of the Muſcles, ſometimes in one Part, and ſometimes in another, or by too free Excurſions of the Spirits, now ruſhing inordinately into one Nerve, and then into another; or for the Conveniency of changing into a cool Place, which the Patient hath not before made hot; and ſuch toſſing about will be continual, becauſe the Cauſe of deſiring freſh Cold will always continue, which is a burning Heat.

Pulſe hard, &c. The Pulſe will be hard from the Dryneſs of the Artery, and its difficult Reſtitution inwardly againſt ſuch an *Impetus* of ſwift and rarified Blood.

Fiery Urine. The Urine is of a Flame Colour, and hath nothing of Sediment in it, ſince by Means of its increaſed Velocity, or difficult Motion of its more ſolid Parts, or both together, it cannot recede latterally, ſo as to enter the ſecreatory Organ; but that may notwithſtanding paſs ſo which is moſt Fluid, and in Company with the more active, rigid Particles that are ſeparable, and which give to the Urine its thin, ſhining, and fiery Colour.

Duration and Termination.

This Fever will laſt ſo long as this State of Blood continues, and until the peccant Matter can, by the accelerated Motion of the Diſtemper, or by Medicines, be purged away, by its being reduced to this or that Nature as renders it ſeparable through the Inteſtines, Glands of the Skin, or Kidneys, *&c.* A *Cauſus* therefore terminates either by Stools, Sweat, Urine, Vomitings; or Abceſces, if the peccant Matter is depoſited upon any Parts of the Body where it putrefies, *&c.*

Conſequences.

Becauſe then in a *Cauſus* there is an exceeding and burning Heat, where therefore it ſeizes a Perſon, and the Quality of Cold would otherwiſe moſt predominate, every Thing will be moſt changed from its natural Courſe; and in old Perſons, and a cold Conſtitution of Air, Temperament, or Seaſon of the Year, cold Things do moſt exert their Qualities; if a *Cauſus* therefore ſeizes a Perſon under ſuch Circumſtances, Nature will be moſt perverted from her accuſtomed Courſe, and will therefore with the greateſt Difficulty be brought to it again, or Death will follow: But if this *burning* Fever comes on in more temperate Seaſons of the Year, as in Autumn, its Rage may be moderated,

and

and a Fever produced with a leſs Degree of Heat and Dryneſs, ſuch as a *Quartan*, either *continued* or *intermitting*. Death alſo may be the *Conſequence* of a *Cauſus*, as *Hippocrates* aſſerts, when it is attended with a racking Pain of the Belly, or any other Part; becauſe ſince in this Caſe the Fever is ſuppoſed to come from Pain, it will be ſo violent, and ſo agitate the Body, as to exhale all its Humidity; and if therefore the Pain be ſtill protracted longer than any Humidity remains, the Fibres will either break, or be unable to move by Reaſon of their Dryneſs, and conſequently Death muſt enſue. From the whole therefore it appears, that the *Antecedents* of a *Cauſus* do vitiate the Blood in Motion, Quality, or Quantity; and that from ſuch Diſorder do neceſſarily follow all its *Concomitants* and *Conſequences*, as in the firſt Place propoſed. It appears therefore that a *Cauſus* without a Period may be reduced to an *Ephemera* of many Days, and is only the moſt intenſe Degree of that Fever from the ſame Cauſes, but in a more aggravated Manner exerting themſelves; and that it may be produced as many Ways as *that* can; the whole therefore is demonſtrated.

PROPOSITION XVII.

The Antecedents *to an* Hectick *may vitiate the Blood in Motion, Quantity, and Quality, but its* Concomitants *and* Conſequences *have a neceſſary Dependance on its vitiated Quality only: And what is an* Hectick.

The firſt Part of this Propoſition abundantly appears from what hath been already ſaid concerning the *Antecedents* to an *Ephemera*, and where almoſt every Thing is recited which is reckoned *Antecedent* to an *Hectick*; and it is alſo there demonſtrated by what Means and Neceſſity they come to vitiate the Blood in Motion, Quantity, or Quality: But moſt of the *Antecedents* to an *Hectick* do ſo plainly of themſelves point out their Manner of Operation, that their Neceſſity of diſordering this or that Affection of the Blood, will abundantly appear without any Recourſe to the preceding *Propoſitions*; and therefore may we take the firſt Part of this to be demonſtrated.

We now further aſſert, that the *Concomitants* and *Conſequences* of an *Hectick*, have their neceſſary Dependance only on a vitiated Quality of the Blood. For becauſe an *Hectick* is a certain Diſorder that by long Continuance paſſes into a Habit of that Kind, as hath nothing in it unnatural, but Exceſs in Heat and Dryneſs; the Eſſence therefore of this Fever is not to be fetched from its firſt Cauſe, and that which primarily occaſioned ſuch a Diſpoſition to Heat and Dryneſs; but in a certain Confirmation of that Heat and Dryneſs in ſuch Manner, that although the Cauſe firſt inducing them ceaſes to operate, yet thoſe Qualities continue in their Subſiſtance and Efficacies. Notwithſtanding therefore a Heat and Dryneſs of Blood may be increaſed by Means of a vitiated Influx of Fluid through the Nerves, and in like Manner by a Conſumption of its Humidity, the Blood may be vitiated in Quantity, ſo that the Remainder ſhall be neceſſarily hotter and dryer: And becauſe this Fever is ſo conſtituted in a Habit of Heat and Dryneſs, that although there is not ſuppoſed either an irregular Influx of Fluid through the Nerves, or a vitiated Quantity of Blood, but that they are returned from the Cauſe which firſt vitiated them into a natural State, yet this Heat and Dryneſs will remain in the Blood; it is therefore manifeſt that the *Concomitants* and *Conſequences* of an *Hectick*, are not neceſſarily joined with a Diſorder in the Blood's Motion or Quantity, ſince a Combination of them together, that is, the Fever it ſelf may ſubſiſt after ſuch Diſorders ceaſe, or if they never were in Being.

That the *Antecedents* to an *Hectick* do ſo vitiate the Blood in Quality, that it becomes hotter and dryer, appears from the preceding Explanations; it only therefore remains to be demonſtrated, that the *Concomitants* and *Conſequences* of an *Hectick* do neceſſarily depend upon a vitiated Quality of the Blood, in Order to ſuch a ſuitable Definition of an *Hectick* as may include a Combination of all its *Antecedents*, *Concomitants*, and *Conſequences*, neceſſarily depending upon their reſpective Cauſes; and which will not be any very hard Task to perform.

How the Senſe of Heat to the Patient.

Be it then taken for granted that the Blood is hotter and dryer than natural, and that it is become habitual by a long Continuance; ſuch a Heat therefore will become familiar to a Perſon, and its Exceſs will be made tolerable by Cuſtom, eſpecially when it is not very intenſe; as with Uneaſineſs we bear the firſt Changes to the extreme Heat or Cold of Seaſons, yet they ſoon grow tolerable by Uſe; ſo likewiſe we are at firſt very ſenſibly affected by a ſudden Change of Cloaths to thicker or thinner, though after ſome Time it grows unheeded; and the like of many other Inſtances. The Patient himſelf therefore will not diſcern with Uneaſineſs any Heat greater than natural, and will hardly diſcern himſelf to be Feveriſh. But if another Perſon lays his Hand upon the Patient, there will be perceived at firſt a ſlight Heat, as ariſing from the Fleſh much diffuſed, and thereby of no great Energy, or to the firſt Touch but weak; but by a Continuance of ſuch Application, and a Repetition of its Occurſions againſt the Hand, it will become more ſenſible, and as the Heat riſes from dry Humours, it will be altogether deſtitute of ſuch moiſt Vapours as would check its Activity, whence it will ſeem ſharp and pungent. But if this Heat be yet more at Liberty, and in greater Quantity, ſo as to give a more diſcernable and vivid Perception to the Touch, in the original Source of hot Humours, the Arteries, than in the circumjacent Parts, a greater Degree of Heat will be felt in the Arteries than any where elſe. And as hot Irons thrown into cold Water excite in it an Heat, or cold

To a Perſon feeling the Patient.

In the Arteries.

cold Water grows hot by being thrown upon live Coals; ſo the Chyle formed from a freſh Meal, as ſoon as it comes into the Current with an hot Blood, is every Way agitated in its conſtituent Particles, and broke in its Cohæſions, ſo that the included Heat breaks thro' it; whence the whole Maſs of Blood, in Conjunction with the influent Chyle, raiſes a greater Quantity of Heat, and communicates a ſtronger Perception of its Qualities, both to the Patient, and the Hand of another applied to his Fleſh, ſome Time after a freſh Meal, whenſoever taken in, than in any other Space; and ſuch an Intention of Heat will continue as long as freſh Chyle drains into the Blood, for all that Time a new Heat will be breaking forth; but after all the freſh Chyle hath got into the Blood, and been wholly broke in its Cohæſions, ſo as to have let out all its igneous Particles, then the Patient will revert to that former State of Heat which he poſſeſſed before the Supply of a freſh Meal, and in which he will continue until a Repetition of the ſame Cauſe.

Its Intention upon eating.

From the Doctrine of Pulſes, and what hath been already ſaid in the foregoing *Propoſitions*, it is manifeſt that the Pulſe muſt be changed by an Increaſe of Heat, and become greater and quick-

Pulſe.

quicker; for by a greater Heat of the Blood it will be more rarified in the Arteries, whence a greater Preſſure upon the Brain, and a more frequent and copious Influx of Fluid through the Nerves into the Fibres of the Heart, and conſequently a greater and quicker Pulſe, which will continue the ſame Meaſure, ſo long as ſuch an additional Fervor in the Blood continues; and from thence it will return to its wonted, though diſeaſed State, which is ſmall and quick; ſmall by Reaſon of a leſſer Quantity of Blood and Spirits, but quick becauſe the Spirits, which are generated in ſuch a lax Conſtitution of Blood, are alſo in themſelves more fluid, ſo that although they diſtil into the contractile Fibres in leſs Quantity, yet their Motions will be quicker, and likewiſe the Pulſe correſpondent thereunto; for that increaſed Celerity which is obtained from a thinner, and a leſs Quantity of Blood, occaſions its Stay under the Finger applied to an Artery to be much ſhorter.

Becauſe the natural Colour of the Urine depends upon a due Contemperature and Mixture of its ſolid and fluid conſtituent Parts in a diſeaſed State, therefore the Urine will be like to that of a well Perſon, as long as there can be maintained a Contemperature like to that of an healthful State. When then in a greater Heat and Dryneſs of Blood there is given a greater Quantity of dry, and a leſſer of humid Parts, on this Account the Urine will be higher-coloured than natural; but becauſe by the Activity and Force of theſe two Qualities, Heat and Dryneſs, when they are in full Liberty, there is continually a great deal of Humidity abſorbed from the ſolid Parts, which they conſtantly act upon, and waſte; ſome Parts of that may join with the aduſt Humours, ſo as to make a Mixture and Contemperature like to what is natural, and give to the Urine the Appearances of one in a State of Health; and this is the Reaſon why the Colour of Urine in *Hecticks* is like to that of well Perſons. And this alſo ſuggeſts to us the Reaſon, why, upon the Aggravation of an *Hectick*, ariſing to its *ſecond Degree*, the Urine becomes greaſy, or as if Oil ſwam upon its Surface like a Cobweb; for by ſuch intenſe Heat every Thing is ſet in Fuſion that is purely fat, or lighter at leaſt than Urine, but cohering in its Parts like all fat Subſtances, and may therefore have a Reſemblance to what it is not in Reality.

Further, becauſe through a Poverty of Blood, the Fluid in the Nerves too *Heavy to Motion.*

muſt likewiſe grow defective, all thoſe Faculties which the Body enjoys by Virtue of either muſt grow languid, and the Inſtruments of Strength will fail, or will at leaſt impair in Quantity, and by a greater Laxity of Texture waſte in Tranſpiration; whence an *Hectick* Patient muſt be feeble, and ſlow to Motion.

Heat in the Hypoconders. That Heat which is remarkable in the Hypoconders, proceeds from the ſame univerſal Cauſe, but in the right Side more particularly, on Account of the *Liver*'s lying moſt there, which being the Seat for Bile, ſuch a Humour in this Circumſtance will be very ſharp and hot, beyond what it is in a natural State; although this *Viſcus* alſo extends into the left Hypoconder, and there alſo excites conſiderable Heat: The like alſo happens in the *Spleen*, wherein it is certain that the Blood is prepared for its better Separation of Bile when it comes to flow into the *Porta*; and thoſe Animals growing more ſalacious, and more ravenous, which have their *Spleen* taken out, is a moſt certain Argument, that by ſuch a Loſs there is ſomewhat left in the Blood that makes it more ſharp, and which, when ſeparated in the Liver, is naturally ejected with the Bile. This Humour therefore in the *Spleen* will in like Manner grow more ſharp, and excite a greater Heat. To this alſo may contribute the acrid Juice of the Stomach, and the rarifying boiling Juice of the *Pancreas*; but the reſt both of *Concomitants* and *Conſequences* are in themſelves manifeſt.

From the whole therefore it appears, that all the *Concomitant* and *Subſequent* Affections of an *Hectick* do neceſſarily depend upon the Dryneſs and Heat of the Blood, or upon its vitiated Quality; and likewiſe that its *Antecedents* do ſo vitiate the Blood in Quality, that it loſes its Humidity, its Heat becomes more free and active, and its dryer Parts alſo more diſunited in their Cohæſions; all thoſe Things therefore that vitiate the Blood's Quality in ſuch Manner, that it acquires thereupon greater Heat and Dryneſs than natural, and that too of ſuch a Nature as paſſes into the very Habit, and ſubſiſts after its generating Cauſe ceaſes, all thoſe Things, I ſay, will cauſe an *Hectick*; and its very Eſſence conſiſts in this very habitual Diſpoſition, which is nothing elſe but a greater Heat and Dryneſs than natural, protracted and changed into an Habit; nor is there any other Way, as is manifeſt from the very Nature of the Thing, of producing this Diſtemper.

But it is yet worth while to obſerve as to theſe Cauſes, if we have Regard to thoſe which may poſſibly happen, although they never or ſeldom do ſo, it may chance that the firſt Diſorder of all may be in an Exceſs of Heat and Dryneſs, or in an hot and dry Temperature, not in the Blood, but in the Solids themſelves univerſally; for it is poſſible that theſe of themſelves may be ſuddenly, or by Degrees, defrauded of their natural Moiſtures, either from ſome peculiar Make of the Conſtitution, or from ſome external Cauſe, in ſuch Manner that the oppoſite Qualities of Heat and Dryneſs may take Place; and when this Error is once contracted by the Solids, it will eaſily and neceſſarily be communicated to their contained Fluids, ſo as to enter into intimate Contact with their conſtituent Parts. But on theſe Conditions an *Hectick* will ariſe that will ſoon terminate in an incurable *Maraſmus*; for theſe very ſolid Parts, which otherwiſe might be repaired by Juices in their natural State, do now themſelves deſtroy that neceſſary Property in the Juices, whereby the Diſeaſe comes to be fatal on a double Account; if then this Fever is to be denominated from the Part that is primarily affected, it is not to be pronounced an hot and dry Temperature of Blood, but of the ſolid Parts; which as it alſo may be the Caſe, there is another Way, poſſible at leaſt, of producing an *Hectick.*

PROPOSITION XVIII.

From a Blood vitiated in ſuch Manner that it becomes more thick and viſcid, and its hot Parts not ſo eaſily diſengaged by the natural Force of Circulation, theſe neceſſarily follow: Heavineſs of the Body; Liſtleſneſs to Motion, with a Decay of Strength; Chillineſs of the extreme Parts, which by Degrees ſpreads all over the Body, but leaſt in the Head, the ſame increaſing to a very great Senſe of Cold, accompanied with Trembling and Shaking, and a Perception of Cold only, or of ſome other Force that is pungent, compreſſing, and as it were even breaking the Bones: During this the Pulſe is weak and ſlow, but ſometimes likewiſe quick, yet ſo depreſſed, that the Artery ſeems to be loſt, and ſunk lower into the Fleſh, and ſo contracted, as if the Artery were ſhrunk into its own Center, and ſometimes quite imperceptible to the Touch. After this an Heat ſeems to be felt, but its Progreſs is oppoſite to that of the Cold; for as that firſt ſeized the

the extreme Parts, and by Degrees paſſed to the Center, ſo the Heat arrives at the Extremities laſt, which ſhall even continue cold after the whole Trunk begins to glow with Heat; but ſometimes the Cold and Heat are felt alternately, before a Perſon paſſes into a ſettled Heat. On the Increaſe of Heat, the Pulſe grows ſtronger, greater, and quicker, and the Artery ſeems to riſe nearer the Surface, and open it ſelf, and will be felt to beat, where in the cold Fit it could not be at all perceived. The cold Fit is over in ſome Hours Time, but the hot one laſts for one, two, three, or more Days. But from the ſame Diſorder of Blood it may neceſſarily happen, that a Feveriſh Heat may firſt appear without any preceding Cold, that its Continuation may be for one, two, three, or more Days, and that from its Attack it increaſes to a certain Height, after which it decreaſes; and it is to be obſerved, that this Heat obeys the ſame Rules of Progreſſion as in the firſt Caſe ſuppoſed, and that on its firſt Attack the Pulſe is weak, low, and for the moſt Part unequal, ſo as not to beat always with the ſame Force and Quickneſs; but on the Heat's Increaſe, it becomes greater, quicker, and ſtronger; but this Inequality may alſo happen in the Caſe firſt propoſed.

Becauſe the Blood is ſuppoſed to be rendered more thick and viſcid, it will therefore be rendred leſs fluid in its groſſer Parts, and the more viſcid will be leſs ſuited to flow uninterruptedly along the Coats of the Arteries, and therefore it will not be ſo faſt propelled forward by the contractile Force of the Heart, where it will retard in its Paſſage, and as it were crowd the Veſſels, and by Degrees bring on a Perception of Weight. From this *Lentor* that is ſuppoſed in the Blood, it alſo follows as a neceſſary Conſequence, that the Secretions therefrom will be made with more Difficulty, becauſe the Particles to be ſecerned will be more cloſely entangled in thoſe viſcid Cohæſions, and as it were more ſtrongly bound up, which therefore, in Order to their Diſengagement, require a greater *Impetus* of Attrition between the Blood's conſtituent Particles; and ſince ſuch Attrition depends upon the Blood's Velocity, where it flows ſloweſt, there will be the greateſt Reſiſtances to any Separation; and ſince of thoſe Parts to be ſeparated from the common Maſs, thoſe are of the moſt Importance which contact the Muſcles, by being partly ſecerned in the Glands of the Brain, and partly from the Arteries immediately into

Whence Weight of the Body.

Liſtleſneſs to Motion.

into their elaſtick Fibres, therefore the Muſcles in this Circumſtance will be leſs contacted, that is, there will be leſs Strength, whence a Difficulty, Sluggiſhneſs, and Inaptitude to Motion, and every Thing of that Nature, inſomuch that a Perſon ſo ſeized, will on all Sides ſeek for Support, and want to lie down.

Decay of Strength.

Whereas therefore the Blood grows hotter by Motion, and that by no other Means than as in ſuch Motion its conſtituent Particles ſtrike againſt one another with greater Force, and thereby break off and ſeparate from their former Cohæſions, whence the Heat gets more Liberty, and diffuſing it ſelf on all Sides, affects the Organs of Senſation againſt which it occurs with a greater Perception. On a double Account therefore in this State, the Particles exciting Heat meet with a Difficulty of Diſengagement, both by Reaſon of a ſlower Motion in a viſcid Blood, and the Nature of its Viſcidity, which reſiſts the Separation and Attrition of its Particles, whence the Heat is more ſtrongly reſtrained and entangled. The leaſt Heat therefore will be ſeparated, where the Velocity of the Blood is leaſt; and the leſs Quantity of Heat will yet be ſeparated in thoſe Parts, wherein, to a diminiſhed Velocity of Blood, is added a great-

Whence Cold.

In what Parts chiefly.

greater Degree of Viſcidity, from whatſoever Cauſe ſuch an Increaſe of Viſcidity proceeds. Becauſe therefore in every Section of an Artery the Velocity of the Blood decreaſes, in Proportion to their Diſtances from the left Ventricle of the Heart; conſequently there muſt be the leaſt Velocity in the capillary Arteries: but not ſo that this diminiſhed Velocity is in the ſame Degree in every Capillary, but where they are ſmalleſt, and at greateſt Diſtances from Branches, that are ſmalleſt alſo in their Origin; for although even in thoſe Ramifications that are immediately from the Heart, or from the Trunk of an Artery very near it, the Blood's Velocity is much leſs than in the Trunk it ſelf, yet it is there much greater than in the Capillaries from Ramifications of Arteries very diſtant from a large Trunk, or the Heart it ſelf.

Not in the Heart or Lungs.

But if theſe capillary Arteries terminating near the Heart, happen to be upon Parts conſtantly in Motion, and to be diſtributed through them in Plenty, they will be ſo affected by their Motions, as to give a much greater Quantity of Agitation to their circulating Contents; whence the Blood's Attrition and Solution, with the Diſengagement of its Heat, will be much more promoted, inſomuch that very little of the Senſe of Cold will be perceived therein; and of this Kind are the Heart and Lungs, and therefore will there be no Cold at all, or very little complained of in thoſe Parts: But ſince in the Extremities of the Body there is hardly any Preſſure from the Muſcles, and contractile Membranes, the Blood's Velocity will be there leaſt of all, not only by Reaſon of the greateſt Diſtances from the Heart, but for Want of that Compreſſure which the Arteries in thoſe Parts have not the Benefit of.

But in the extreme Part.

Further, becauſe the *Impetus* and Velocity of the Blood decreaſes in thoſe Sections of the Arteries moſt diſtant from the Heart, both on Account of its Occurſions and Reſiſtances, the Decreaſe of its Velocity from Reſiſtances will be yet much greater in ſuch a vitiated State of Blood as renders it more viſcid, for it will flow with much the more Difficulty, from the Stops of its moſt glutinous and adheſive Parts againſt the Coats of the Arteries; and on that Account will alſo its Velocity be much retarded. Add to this, that as the Blood is ſuppoſed to be thicker, it will eaſily, for that Reaſon, totally obſtruct the capillary Arteries; not by Particles of Blood disjoined from the reſt, wherein ſome flow near the Axis of the Veſſel, and leave others behind them in Contact all round its Sides, which are either leſs ſuited for Motion in themſelves, or more apt to be detained in Contact with the Membranes, but by all and every Part that circulates near the Sides, and adheres to the internal Superficies of the Arteries, and by that Means gives greater Obſtruction to all further Motion through them, till its whole Circuit is ſtopped; and this is, for all the Reaſons already recited, the more particularly effected in the extreme Parts, becauſe the Influence of external Compreſſion is there much the leaſt. But there are alſo very many Things which naturally give great Diminution to the Blood's Velocity, and in this Circumſtance it ſeems almoſt altogether to be ſtopped; but if it arrives to its greateſt Degree of Thickneſs and Viſcidity, its Motion then wholly ceaſes. In the preſent Caſe then let it be ſuppoſed, that by this Property only ſo much of the Blood's Velocity is diminiſhed, that its igneous Particles cannot get into Liberty enough to excite Heat; hence may a very great Degree of Coldneſs be felt in the Extremities. But this Senſation will notwithſtanding be never able to reach the Head, even although there are a great many capillary Arteries about it;

Not in the Head.

for there they run croſs one another very often, and empty into each other, from whence the ſame Particles of Blood ſtrike oftner againſt one another with ſome Degree of *Impetus*, and whence ſo much Heat may be ſet at Liberty, as to preſerve the Brain and circumjacent Parts in their natural State of Warmth; and which it can for this Reaſon never be ſaid perceptibly to recede from.

Its Extenſion all over the Body.

Becauſe the Blood vitiated in this Manner obſtructs in the capillary Arteries; the Time therefore being given of its compleat Circuit once through the whole Body, a leſſer Quantity of Blood will flow through the Arteries into the Veins, than is wont to paſs through them in that Space of Time; and therefore during that whole given Space, in which the Blood is ſuppoſed to finiſh one compleat Circuit, the Blood muſt flow ſlower thro' the Veins than naturally; and conſequently in every Contraction of the Auricles of the Heart will there be leſs Portion of it paſs out of them than in a natural State, and that leſs Portion will leſs fill the Arteries, and occaſion a leſs Attrition of the Particles of Blood againſt one another, and a more languid Diffuſion of Heat. There will likewiſe be a weakned Contraction of the he Heart, by Reaſon of a leſſer Influx of Spirits into its Fibres, when they come to be ſeparated in the Brain from a thicker Blood, and alſo a leſſer Velocity of the Blood it ſelf, by Means of its Viſcidity through the coronary Arteries, on both which Accounts there will be leſs Attrition, and leſs Diffuſion of Heat; and as this gradually makes its Progreſs further than the Capillaries, the whole Maſs will be under ſome Sort of Stop; and ſince it is ſuppoſed to be in ſuch a State of *Lentor* and Viſcidity, that it cannot by the *Impetus* of its natural Velocity be duly comminuted, much leſs will it be ſo when flowing with a diminiſhed Force; and therefore will the Perception of Cold extend it ſelf alſo to other Parts, and ſeize the whole Body. And yet not only in the Time of a compleat Circuit, but in any given Space, does the Blood flow in leſs Quantity out of the Arteries into the Veins, than otherwiſe it would do naturally in the ſame given Space; in Caſe that through the Arteries more or leſs obſtructed, ſome thinner Parts of the Blood do not ſupply the Defect of ſuch a retarded Velocity; but this can hardly be expected to happen in a Velocity ſo much retarded, as here is ſuppoſed from a weakned Contraction of the Heart.

Accompanied with pricking, &c. If further the Matter obſtructing the Heat's Diffuſion is of that Nature as to vellicate, ſtimulate, and as it were prick the Membranes, there will at the ſame Time be a Perception of Cold accompanied with a Pungency; and if it be very groſs, ſo as to fill the Capillaries, and quite ſtop them up, and if the animal Spirits are carried through the Nerves with great Difficulty into the Muſcles, there will be cauſed a Senſation, which we expreſs by bruiſing the Fleſh, or breaking the Bones themſelves, and the like, as will appear from the Doctrine of Weights, Fractures, *&c.*

With Tremors. Again, as it is neceſſary to the Regularity of Motion in Parts enjoying Antagoniſt Muſcles, that ſuch a certain Quantity of nervous Fluid and Blood ſhould flow into each Muſcle, in order to give them equal Powers of Expanſion, whenſoever therefore the Quantity of Fluid into either of theſe Muſcles is greater than what flows at the ſame Time into its Antagoniſt, one will be contracted and the other relaxed; but this natural Quantity is to be had only from a Blood of a natural Fluidity, ſo that whenſoever it is more thick or viſcid than natural, as it flows in Arteries with greater or leſſer Velocity, according to its Meaſures of Viſcidity in theſe Parts, the

Separation of its proper Fluid into the muſculous Fibres will be more copious in one Muſcle than another, which therefore will render their motive Powers unequal; and becauſe by Means of the Blood's *Lentor*, or its Scarcity in Quantity, that Fluid which is neceſſary to contract the Muſcles, diſtils but very ſparingly into the contractile Fibres, the Contraction of the Muſcles muſt conſequently be very weak; that is, there will be a *Tremor*, a frequent Motion of the ſame Part, and a very feeble Reſtitution of it to its deſired Poſture. But moreover from the Coldneſs of the Parts the nervous Fluid may uncertainly be interrupted, in ſuch Manner as to make it flow ſometimes more plentifully into one Muſcle than into its Antagoniſt, and at others leſs; or this Fluid may be ſo interrupted by the diſtended Arteries againſt its Canals, that it cannot flow in due Quantity into this or that Muſcle, at the ſame Time that it naturally fills its Antagoniſt; with many other Circumſtances of like Nature. But if by the Continuance of a greater Compreſſion from a *Lentor* of greater Tenacity, there is yet made a ſtronger Expreſſion, ſo that the rarifying Fluid hath a leſs Check in its *Impetus*, from Parts more ſluggiſh and unactive, there will enſue a vehement *Tremor* and Concuſſion of the whole Body, ſo that ſometimes one and ſometimes another Part is more ſtrongly ſhook, and in the ſame Part ſometimes one and now another Muſcle, without any Equality or Certainty.

The Pulſe
weak,
ſmall,
ſlow,
ſometimes quick.

Yet ſince all this while the Heart continues in Motion, when it is ſupplied with a leſſer Quantity of nervous Fluid into its contractile Fibres, the Pulſe will be weak; if a leſſer Quantity of Blood than natural paſſes through the Auricles and Heart when they are contracted, the Pulſe will be ſmall; and when ſuch a diminiſhed Quantity flows with a diminiſhed Velocity, it will be alſo ſlow, and the Spirits inſtil more ſlowly into the contractile Fibres: But becauſe it is poſſible to happen, that in the Secretion of a nervous Fluid, by Means of a greater *Lentor* in the Blood, when it ariſes from a greater Preſſure, and a ſtronger Cohæſion intangling the more ſubtle Parts, the Spirits may be ſeparated more ſharp; it will then occaſion the Pulſe to be weaker through a diminiſhed Quantity of Spirits in the Nerves, but alſo more quick at the ſame Time from their greater Activity and Subtilty, and their more quick and frequent Inſtillation into the Fibres. The Pulſe alſo may be unequal, both as to the *unequal,* Times between its Beats, and the Strength of it againſt the Finger; for ſince theſe Affections of the Pulſe are as the Conditions of the circulating Blood, it is not to be expected that they ſhould be always the ſame, becauſe they depend upon the uncertain Meaſures of Blood differing in Degrees of Fluxility and Velocity; but the Times between every Pulſation, are as the Diſtillation of the nervous Liquid into the Fibres of the Heart, and that is varied as many Ways as a Blood unequally Fluid is capable of paſſing through the coronary Arteries, and thoſe in the Head. But becauſe the Blood is contracted by Cold, or confined within leſs Space, and the Membranes alſo ſhrink from the ſame Cauſe, when a leſſer Bulk of Blood flows through the Arteries than natural, the Arteries will ſhrink inwards, and that Part of them towards the Skin draw from it, ſo that the Pulſe will be as it were contracted and buried; *contracted,* and the Artery will, to a diligent Obſerver, ſeem to have grown ſlender, by its ſhrinking on all Sides towards its own Center. But becauſe the *Impetus* even of a natural Blood decreaſes continually, and is much more diminiſhed by the diſordered

Quality above ſuppoſed and explained; as often therefore as a Blood is given of ſuch a *Lentor*, that by the *Impetus* impreſſed from the Heart it is not propelled ſo far as thoſe Trunks of the Arteries where we feel to examine the Pulſe, or that it hath not Force enough there to thruſt their Coats outwards, then there will be no Pulſe at all diſcernable in thoſe Parts.

none at all.

How Heat exexerts it ſelf.

Since likewiſe the hot Particles of the Blood are ſo reſtrained by the viſcid ones that they cannot perſpire, if therefore they come under ſuch a Degree of Preſſure, joined to the *Niſus* of ſuch Particles to diſengage themſelves, that exceeds the Force of Cohæſion in the implicating Parts, the Heat will at length break forth, exert its Energy, and become perceptible to the Organs of Senſation. When therefore a viſcid Blood adheres in the Capillaries, and there is a continual Afflux of a freſh Quantity, there will at leaſt be accumulated ſo much as to obſtruct them, whence upon a double Account will it come to be ſtrongly and continually preſſed upon, both from the following Blood, and from that contractile Force in the Arteries, which makes them reſiſt all Diſtention. Such Compreſſion therefore continually increaſing, its *Momentum* will at length exceed that in the Cohæſion of the viſcid Parts, whence the Heat will get diſengaged, and ſtrike againſt the Nerves with a perceptible Impulſe; but after ſome Portion of Heat hath got at Liberty, it greatly facilitates the Eſcape of the Remainder by its Activity and Motion on all Sides, and ſubduing and breaking the Viſcidities, not unlike what the Fire does to Wood laid upon it; and hence the Heat comes eaſily to diffuſe it ſelf all over.

Not firſt in the Limbs.

But becauſe the Heat then only comes to break forth, when the Quantity of Contraction exceeds the Power of Implication from Viſcidity, ſuch Contraction will be ſo much the greater, where the Blood's Velocity is greateſt, and the Velocity is greater in Ramifications near the Heart, than in thoſe which have their Riſe further off; and therefore the Force of Compreſſion, exceeding that of Implication, will ſooner happen in Arteries near the Heart, than in any other that ariſe at a further Diſtance from it; that is, the Heat will be felt in the extreme Parts after it hath ſome time warmed the Parts near the Heart, inſomuch that the Limbs ſhall be cold after the Trunk glows with Heat, and ſuch Cold will continue until the Force of Contraction exceeds that of Implication, and the

Heat is let out by an increaſed Agitation of the Blood's conſtituent Particles, and a Comminution of its Viſcidities. But ſince theſe oppoſite *Momenta* are very uncertain, and not reducible to any knowable Meaſure, and that it cannot be alſo told how long the Cold will laſt in the Limbs after the reſt of the Body grows warm, it can only be in general pronounced, that the Cold will remain ſo long in the Limbs as the Viſcidity there continues to implicate and fold up the Particles of Heat.

Heat and Cold alternately.

But if the Blood happens to be unequally viſcid, ſo that ſome Capillaries contain Blood of leſs Cohæſion, or eaſily letting out its Heat, while other Parts circulate that which is more cohering and viſcid, the Heat will not be perceptible in each Place at the ſame Time; but ſooner where the leſs cohæſive Blood paſſes, and later where the more viſcid circulates; whence Heat and Cold will alternately ſucceed each other for ſome Space. The ſame likewiſe happens, if Blood of theſe different Qualities is at the ſame Time contained in different Parts of the ſame Artery. But further, becauſe the Blood is more compreſſed in the Capillaries than in the Trunks, therefore after a Portion of Blood hath got its Liberty in the Capillaries, and its Heat hath diffuſed it ſelf, there will be Room made for the Reception of more Blood out of the greater Veſſels, and the Spaces made by the Action of Heat between the Particles, will yield to an Influx of freſh Blood into ſuch Capillaries; if then ſuch influent Blood, which is ſuppoſed viſcid, is not immediately rendered fluxile by the Action of that Heat which it finds already at Liberty in the Capillaries, by a Preſſure of freſh Blood ſtill from the Heart will ſuch Arteries be again crowded, and the Heat will be again ſo much implicated as not to be perceptible, and therefore in the ſame Place will there immediately follow a Senſe of Cold, whether it be particular or all over the Body; after which, by the ſame Neceſſity as before, will return a Diffuſion of Heat; to which, if what hath been already explained, happens another Succeſſion of Cold, and ſo on alternately, there will for ſome Time be perceived Succeſſions of theſe two Oppoſites.

The continual Heat.

After much Heat hath been diſengaged with ſuch other Particles as are moſt diſpoſed to Separation on an invigorated Compreſſion, and more fluxile, the Blood will thus paſs into the Veins, where the Heat will get yet more Liberty, and be more active, and therefore will it agitate the Blood *increaſing,* which it finds in the Veins on all Sides, and by greatly heating and rarifying it, will again further break its Cohæſions, and ſet at Liberty all the igneous Particles contained therein; whence will be excited a very intenſe Heat, and free Motion and Occurſion againſt the whole nervous Syſtem, and through them a great Perſpiration and Diffuſion; *perſiſting,* and that continually, both out of the Veins from the refluent Blood thro' the Lungs into the Heart and Arteries; and in that Blood which hath not yet paſſed out of thoſe Arteries into the Veins, will there be excited the ſame Heat and Rarifaction, and the Augmentation will be yet faſter. But this Augmentation of Heat will no further continue than a new Quantity of igneous Particles can be ſeparated from the Blood, both in the capillary Arteries and their Trunks, as alſo in the Veins; but as the Heat continually perſpires, it will ſeem to remain in the ſame Degree, as long as it is not waſted in *decreaſing.* Quantity enough to let the Fever ſink, and be unable to affect the Senſe of Feeling ſo perceptibly, as to exert a more remiſs Warmth, which, by a Continuance of Perſpiration muſt happen, and conſequently the ſame Quality grow more languid.

How far the Increaſe, Height, and Decreaſe of the Heat may be protracted, cannot certainly be determined; but ſo far at leaſt we may venture to aſſert, that it will be of the leaſt Duration, when the *Lentor* of the Blood hath ſome Mixture with it of an aqueous Viſcidity, that is, what may be ſooneſt diſſolved, and rendered fluxile; for in this Caſe the Blood will adhere to the inner Coats of the Arteries, but as ſoon as ever the Heat begins to diffuſe, and make more Room for the ſucceeding Blood, ſuch Adheſions will be deterged away by its *Impetus*, and the Arteries quite cleared of all beginning Obſtructions by the Briskneſs of a Current exceeding ſuch Reſiſtances, and able to excite a Heat greater than natural: But if this *Lentor* of the Blood be joined with the Quality of Dryneſs, and makes as it were a dry Viſcidity, that is, one that is the leaſt diſpoſed to Fluidity, then although the Heat firſt at Liberty does make more Room for the ſucceeding Blood, yet becauſe this Viſcidity adheres to the Arteries with ſuch Obſtinacy as not to be removed by the perfluent Stream, and the ſucceeding Blood fills up the whole Capacity of the Artery, whoſe Parts neareſt the Superficies are already ſtuffed with a dry tenacious Matter, the Blood muſt flow through with great Difficulty, and be ſo ſhook and comminuted, that a much greater Plenty of Heat than what is natural will break looſe, and give a very intenſe Perception of it to the Senſes.

Duration of the cold and hot Fit.

According to the different Degree therefore and Quality of this *Lentor*, the Increaſe, Height, and Declention of the Heat may be of different Durations, and the hot Fit only be protracted for one, two, three, or more Days, as before obſerved; from whence, and what hath been already demonſtrated, the Duration of the cold Fit is very uncertain; and this likewiſe depends upon the different Degree and Quality of the *Lentor* in the Blood, whereby it is ſooner or later conquered, and the Heat given a Liberty for Diffuſion.

The Pulſe,

Becauſe therefore upon the ſucceeding Heat the Blood is rendered more free, fluxile, hot, and rarifyed; therefore the Arteries will be the more filled, and conſequently dilated outwards, ſo as to be more felt at the Surface, and riſe as it were upwards; and as they become fuller, the Pulſe muſt be greater; and that they are in Reality fuller is manifeſt, for upon ſuch Solution of the Blood a greater Quantity of it returns into the Veins, and the Pulſe will be alſo ſtronger; further, becauſe the Blood is hotter than in its natural State, the Heat will ſtimulate the Heart beyond what it is wont naturally to feel, and a greater Quantity of Spirits will be derived into its Fibres, whence they will be more ſtrongly contracted: Again, when a greater Quantity of Blood is diverted to the Brain, and that too is of a more lax Cohæſion, a greater Quantity of Spirits will be generated, and as they will be alſo hotter at the ſame Time, they will exert themſelves with the greater Energy, or contract the Fibres of the Heart more ſtrongly; and this they do more efficaciouſly, becauſe the Blood it ſelf, from whence they are generated, is likewiſe hotter and ſharper: And when the Spirits diſtil more copiouſly and more frequently into the contractile Fibres of the Heart and Muſcles, the Pulſe on that Account muſt be more frequent. But if the Pulſe in a cold Fit ſhould altogether diſappear, either becauſe the Blood does not reach ſo far as thoſe Arteries where we examine for it, or becauſe its Diſtention of them is imperceptible, therefore the Blood's Velocity being again reſtored, by the Means already explained, it will arrive again to theſe Parts, and diſtend them ſo much as to excite the uſual Pulſe; which will increaſe until it becomes great, ſtrong, and frequent, as already

greater,
ſtron
and mor
quent.

ſaid. That all which ought to be demonſtrated in the firſt Part of this Propoſition, appears from our Explanation of the Hypotheſis.

Heat without any previous Cold.

In the ſecond Place then let the Blood be vitiated with a *Lentor*, not much unlike what is already ſuppoſed; that is, one that is viſcid and thick; but in ſuch a Degree, that by the Force of its natural Circulation it may be reduced to ſuch a Quantity of Heat as may be ſufficient to anſwer that which is natural, or but little, if at all, receding from the Meaſure of Heat by Nature required. In this Caſe, I ſay, it will happen exactly as propoſed in the ſecond Place. For becauſe the Blood is ſuppoſed to be more viſcid than natural, therefore it will be retarded in the Capillaries; but then as it is ſuppoſed by the natural Courſe of Circulation to be diſſolvable into ſuch a Laxneſs of Texture as will be ſufficient to diffuſe Heat equal to what is natural; although therefore it is ſo retarded in the Capillaries, it will not yet produce a Perception of Cold, for even where it is retarded it meets with Compreſſion, and Attrition enough between the Blood's conſtituent Particles, to let ſo much Heat eſcape as is here taken *ex Hypotheſi* ſufficient.

But becauſe in the firſt Part of this *Its Increaſe.* *Propoſition*, the retarded Parts of the Blood are more and more compreſſed, that is, the *Momentum* of Compreſſion is ſucceſſively greater and greater; if therefore by any Part, or Parts of ſuch Force, of all which collectively the whole *Momentum* is compounded, the Blood can be broke into Particles ſufficient to keep up a natural Heat, as by *Hypotheſis*; by the whole *Momentum* collectively muſt there be a much greater Quantity of Heat produced, which will flow out of the Arteries into the Veins, be much more diffuſed, and exert a much greater Commotion, Rarifaction, *&c.* or it will much more heat all the Parts of the Body as it perſpires through them, and give a greater Perception, to the Organs of Senſation, of its Qualities.

In like Manner the Heat will in- *Height.* creaſe while the reſt of the Maſs flows through thoſe Arteries half obſtructed by the viſcid Parts of the preceding Blood adhering in its Paſſage; for hence will there be ſtronger Compreſſure and Attrition, whence a greater Quantity of Heat will eſcape.

In this State of greateſt Heat the *Declention.* Body will continue, until the diffuſed Heat perſpires, or joins it ſelf with the reſt of the Blood, and makes a perfect

Combination therewith; and it may perſpire not only by Evaporation thro' the Blood-Veſſels, but alſo by its Expence in muſcular Motion, and the Generation of Spirits. But after the Heat remits, either by Perſpiration, or its Combination with other Parts of inferior *Moment*, ſo that its Decreaſe is even manifeſt to the Senſes, the Fit is then ſaid to be going off, or in its Declention ſo long as, by a continual Diminution, it is returning to its natural State.

Duration. But how long a Time is neceſſary for the Augmentation, Height, and Declention of the hot Fit is very uncertain, for this altogether proceeds from the Diverſity of that *Lentor* which is ſuppoſed to be in the Blood, and the Time in which the fuſed Heat can perſpire, or join it ſelf to the reſt of the Maſs; and from the Time wherein the *Lentor* adhering to the Arteries can be wore away, and derived into the Veins; ſince from its Occurſion and Preſſure the perfluent Stream is continually excited into a greater Heat than natural; but the Time of its Continuance is uncertain to be determined, by Reaſon of a greater or leſſer Force of Cohæſion in the adhering Matter; whence only thus much can in general be aſſerted, that as in the firſt Part ſo here, the Duration of the Heat may be protracted for one, two, three, or more Days, according to the Continuance of the original and preſerving Cauſe, or a Cauſe perſiſting to act for one, two, three, or more Days; and concerning this Duration of the hot Fit, both in the firſt and laſt Place, we ſhall more diligently examine in the following *Propoſition.*

The Pulſe at firſt ſmall, weak,

But becauſe alſo in this ſecond Caſe ſome Part of the Blood adheres in the capillary Arteries, by Means of its *Lentor*, therefore the Blood paſſes from the Arteries into the Veins in a leſſer Quantity than natural, and conſequently is there leſs of it than natural in Readineſs to fill the Auricles upon every Contraction, whence a ſmall Pulſe. Becauſe alſo from ſuch diminiſhed Quantities of the common Maſs, there muſt be a leſſer Quantity of Spirits ſeparated into the Fibres, which alſo will the more difficultly be ſeparated by Means of the Blood's Viſcidity, therefore a diminiſhed Quantity of Spirits will be derived from the Nerves into the contractile Fibres of the Heart, whence they will reſtore themſelves more weakly, and thereupon render the Pulſe weak; and further, if with this diminiſhed Quantity of nervous Fluid be joined its natural *Lentor*, or a *Lentor* greater than natural, by Means of the viſcid Blood from whence it is ſecerned, the Pulſe will then be alſo ſlow. Yet if from the Blood's *Lentor* it comes about that only the more active Spirits are ſeparated into the Nerves, their Influx then into the Fibres of the Heart, by having a greater Liberty of Motion, will be more frequent, whence the Pulſe too will partake of the ſame Property; but if, laſtly, the Spirits flowing into the contractile Fibres of the Heart, and the Blood paſſing its Ventricles, be in uncertain Meaſures, then the Inequality of *this* in Quantity, and of *theſe* in the Times of their Influx, will alſo make the Pulſe unequal, as explained in the firſt Caſe: But in the Increaſe the Pulſe will be likewiſe greater, ſtronger, and more frequent, as before explained; and therefore the whole Propoſition is manifeſt.

ſlow,

frequent,

unequal.

PROPOSITION XIX.

The ſame being granted as before, that Lentor *which produces a Senſe of Cold by its Adhæſion in the capillary Arteries, is at length waſhed altogether from thence, and carried into the Veins, againſt whoſe Superficies it moves without Interruption, as alſo through both Ventricles of the Heart,*

Heart, and the Trunks and greater Branches of the Arteries, until it is again brought into the Capillaries, where it adheres as before, and undergoing again the ſame, is at length a ſecond Time waſhed through into the Veins, whence returning by the ſame Circuit as before into the ſame Capillaries, it comes to make many Circuits after the ſame Manner. Now if in its Paſſage through one, more, or all theſe Canals, the Lentor *is neither diminiſhed nor increaſed, nor becomes more or leſs fluid, in the ſame Time that the cold Fit ſeized the Patient in its firſt Attack, it will alſo obſerve in the following; if its Quantity increaſes it may return later, as alſo ſooner, or at the ſame Time, all which will likewiſe happen when the Quantity of the* Lentor *is diminiſhed, according as are its Degrees of Reſiſtance to every ſuch Change of its Quantity greater or leſſer; the faſter the* Lentor *is reduced to a natural Fluidity, it will haſten the Acceſſion of the cold Fit, but when more viſcid, it will retard it, although it exiſts but in a very ſmall Quantity. The Time between each Attack may be one, two, three, or more Days; and between every Paroxyſm, after the hot Fit is over, ought to be ſome Interval, wherein the Patient ſeems perfectly well, or in a natural State, but it is not yet abſolutely neceſſary that this* *ſhould always happen. But it may alſo chance for the cold Fit to come on with all its Attendants, ſo that other Acceſſions may anſwer thereunto, both as to the Times of their Attacks, and their Attendants every Day, or every ſecond, or third,* &c. *But in the Interval between every Attack of either Kind, there may happen other Inſults, attended with Cold and other* Concomitants, *ſo as not to ſuffer the Patient to be but very little free, although after every one, returning even every Day, ſome Interval of perfect Health may ſucceed. From this Diſorder of the Blood even Death it ſelf may enſue, which moſt commonly happens in the cold Fit, but that not always neceſſarily. On the other Hand, this* Lentor *that produces a Senſe of Heat is not wholly cleared away out of the capillary Arteries, but that Part of it which is moſt fixed and dry, will always remain in the Arteries, after its more yielding Parts are carried away into the Veins; this ſlowly paſſes by the Superficies of the Coats, and is at laſt carried through both Ventricles of the Heart, the Lungs, and other Paſſages quite round into the capillary Arteries again, as it was before taken Notice of concerning that* Lentor *that produces a Senſe of Cold, and it recurs every Day, every ſecond, third,* &c. *as it was alſo obſerved of* that.

But in this they differ, in that the Lentor *which produces Cold leaves the Patient quite well between its Inſults, whereas that producing Heat never leaves a Perſon quite well, but a new Paroxyſm or Inſult returns before the preceding is quite off. From this Diſorder of the Blood likewiſe does Death ſometimes enſue, and that in the Acceſſion of the Heat, but this not neither neceſſarily happens. It may alſo come about that the* Lentor *which produces Cold may be changed into another which will excite Heat; and* è contrà, This *may be turned into* That; *one is more reducible into a natural State, and the other more eaſily terminates in Death: And moreover it may happen, that in the Interval between two Inſults of that* Lentor *producing Heat, there may be an Attack of Cold from its proper* Lentor *yet remaining in the Capillaries; and hence may ariſe a Diſorder that partakes of both. But in like Manner may the Interchangings and Periods of theſe* Lentors *be ſo ordered, that what recurred with Cold every Day, ſhall recur alſo with Cold every other, or every fourth Day, that of every fourth Day return every other, or every Day; and ſo likewiſe of that* Lentor *which recurs with Heat.*

The Lentor *producing* Cold *is wholly paſſed into the Veins.*

Becauſe the capillary Arteries which are crowded with a *Lentor* producing Cold, will be greatly diſtended and diſtracted in their conſtituent Fibres, by the repeated Protruſion of a ſucceeding Blood, when the Heat diffuſes and perſpires, ſuch Diſtention and Diſtraction will abate; they will therefore endeavour to reſtore themſelves to a natural State, by an Exertion of that Faculty in their Reſtitution and Contraction, by which they were diſtracted and thruſt outwards, as it happens neceſſarily to all elaſtick Bodies whatſoever; and on this Account there will ariſe a great *Niſus* inwards, and the Arteries will contract themſelves for other Reaſons, than becauſe the evaporated Heat has left more Room inwardly: For this *Lentor* is not ſuppoſed quite ſo dry, that it can abſorb alſo the Humidities from the Membranes, ſo that they may loſe their Powers of Reſtitution, or is it become ſo hard in it ſelf as to have formed, in ſome Sort, Canals no Ways yielding to the Contact of the interior Superficies of the Arteries, which could not but hinder their Reſtitutions. Yet becauſe theſe cannot be reſtored but by an univerſal Return of all their Parts inwardly, ſuch Return cannot be without changing the Diſpoſition of that *Lentor*, which is in Contact againſt every Point of their internal Superficies; while therefore the Arteries contract, or are in their Reſtitutions, every Particle of the incloſed *Lentor* muſt change its former Contact, ſo that if in the ſame Time ſome Power is ſuperadded which moves tranſvers to this, and gives an *Impetus* direct or parallel, as near as can be, to the Axis of the Canal, it will eaſily continue its Progreſs without any Reſiſtance from ſuch Contact; and for this Purpoſe is in Readineſs, the Preſſure and Afflux of a ſubſequent Blood; this *Lentor* therefore will be removed from its Adhæſions to the Arteries; and on this Account too the more eaſily, becauſe upon the Reſtitution of the Arteries inwardly, there is not only by their circular Contraction made a Separation in the Contacts of the included *Lentor*, but by the Protruſion of the Particles of Heat into the Spaces they have left, they will be thruſt nearer to the middle of the Canal, and thereby come more within the Power of the circulating Stream, ſo as to be with that quite carried away; and as it is not ſuppoſed either totally dry, or ſo as to rob the Arteries of their Humidities, it will be wholly diſunited from them, as much in one Part as in another;

ther; and when it is disjoined from the Coats of the Veſſels, will its Conveyance by the common Stream, whereever that paſſes, become neceſſary.

And flows in them neareſt their Sides.

Wherefore when the *Lentor* is thus brought into the Veins, and the Blood is become more fluid, yet both theſe will not flow with the ſame *Impetus*; and it will be as in all Currents and mixed Streams conveying Particles of different Gravities; that is, the more Liquid will be moſt ſwift, and flow neareſt the middle of the Stream, as thoſe which move with more Difficulty and Slowneſs will be thrown neareſt the Sides, and therefore the *Lentor* in the Veins will be alſo neareſt their Sides.

Its Cohæſion in the Veins leaſt.

When therefore this *Lentor* is ſuppoſed ſo great, that it cannot be forced away by a ſingle Contraction of the Heat out of thoſe Arteries where the Blood flows with its uſual *Impetus*, but that there is need of more Contractions, by whoſe collected Powers may ariſe a Force ſufficient for the Purpoſe; yet when it comes into the Veins, which are Canals always growing wider from a very ſmall Beginning, its Accumulation cannot there happen, although the Velocity of the Blood is not ſo great there as in the Arteries; its *Momentum*, or *Niſus ad Contactum* therefore with the Veins will be leaſt, whereby what ſtuck to their Coats will ſlide along them without Interruption, tho' with a very ſlow Motion; that is, ſuch a Motion as it is able to obtain from the Exceſs of that Velocity which is in the Veins, above the Quantity of that Reſiſtance which the *Lentor* meets with againſt their Coats; and which Reſiſtance is compounded of the Quantity of the *Lentor*, and the Magnitude of its Contacts; and increaſes according to its Quantity, and the Intention or Remiſſion of its Viſcidity. Therefore after it hath travelled this ſlow Pace through all the Veins, it will arrive with the Blood at the right Ventricle of the Heart, and by Agitation from the forceable Contraction of the Auricles and Ventricles thereof, it will become mixed with a more fluid Blood, and derived into the Lungs, through which it will eaſily paſs, ſince Nature hath ſo contrived it, that the Chyle it ſelf may flow through them, which is a Juice very thick and viſcid. From hence it will come to the left Auricle and Ventricle of the Heart, wherein by their ſtrong Contractions it will again be mixed with a more fluid Blood, or at leaſt prevented from ſeparating from it, whence it will receive a great *Impetus* in the larger Trunks of the Arteries, and like fine Sand floating in a rapid Current, by Means of its acquired Velocity, will it neither ſettle nor tend towards the Sides: But when it arrives again at thoſe Capillaries where it was before obſtructed, it will after the ſame Manner as before accumulate in them, and produce the Senſe of Cold, with all other *Concomitants* mentioned in the preceding *Propoſition*.

How it occaſions Returns. Yet after all theſe are over, the *Lentor*, in the Manner as before, is wholly waſhed out of the capillary Arteries into the Veins, to flow along their Sides as before with a ſlow Motion, and all its other Conditions of Courſe, until it is brought a third Time to accumulate in the Capillaries, and produce there over again the ſame Effects; then a fourth Time it is derived wholly into the Veins, where it performs its Circuit and Return with all the uſual Affections, which alſo is in Order a fifth Time ſucceeded, a ſixth, and ſo on in the ſame Manner and Condition, as long as there does not intervene any Power ſufficient to deſtroy the Viſcidity, or change it in Quantity, or Quality, or in both.

And determines the Periods. But becauſe, in Order to the Conveyance of this *Lentor* into the Capillaries, it is neceſſary that it ſhould flow the whole Length of the Arteries, therefore in Proportion to its greater or leſſer Retardation, its eaſier or more difficult Protruſion through their Extremities, and its greater or leſſer Quantity, is there more or leſs Interval between each Return; ſo long therefore as ſome or all of theſe Conditions continue the ſame, without any Alteration alſo in the Nature of the *Lentor*, it cannot but paſs through the whole Circuit of the Canals in the ſame Time, or which comes to the ſame, the Returns will be alike, that is to ſay, if the ſecond Return is 24 Hours after the firſt, the third will be 24 Hours after the ſecond, and ſo of all the ſubſequent Paroxyſms.

How the Lentor may be changed.

But becauſe this *Lentor* is greatly compreſſed in the capillary Arteries, whereby the Heat is diſengaged therefrom; in that very *Niſus* therefore of Contraction, and the Secluſion of ſuch a moſt ſubtle Matter as that of Fire, the *Lentor* will be more divided by the Agitation of that Matter, while it is in its Efforts for Liberty, and endeavouring to extricate it ſelf on all Sides; its more viſcid Particles will be ſeparated, and thoſe of greateſt Reſiſtance ſubdued, and in ſome Manner fermented; and the *Lentor* will become more fluid, and leſs in Quantity: The ſame to which will likewiſe continue, tho' in a much inferior Degree, while it is flowing through the Veins, where the Heat ſtriving on all Sides, and implicating its ſelf amongſt the Viſcidities, with the more fluid Blood likewiſe acting upon it, and thruſting it towards the Heart, muſt its Diſunion be facilitated. But this Effect will much more remarkably happen in the Lungs, becauſe in them the contractile or compreſſive Force is in its greateſt Energy, and they are on all Accounts ſuited for a Comminution of the animal Fluids.

On the contrary, although by Means of an active Heat the Quantity of *Lentor* may be diminiſhed, yet the Meaſure of its Viſcidity may be increaſed, ſo that the Remainder becomes more tenacious; and this does chiefly happen when the Heat is great and ſudden, ſo that it dries up the humid Parts only of the *Lentor*, and renders the Remainder more unfit for Motion, and by Means of its increaſed Tenacity, more apt to adhere to the Superficies of the Canals againſt which it circulates, and by Reaſon of its Diminution in Bulk, more fitted for Contact with them, and conſequently more unfit for Motion. And laſtly, the Quantity of *Lentor* will be increaſed, and the Blood, or any other Humour, will become more viſcid, when any Thing is brought into the Courſe of Circulation that is more viſcid, or apt to fall into that Diſpoſition when it is got into the Veſſels.

The Returns ſooner or later from an increaſed Quantity.

Let it then be ſuppoſed that this *Lentor* is encreaſed in Quantity, its Extruſion from the Capillaries will for that Reaſon be more difficult, and it will require thereto a more forceable Compreſſion; and ſince ſuch a Compreſſion depends upon repeated Contractions of the Heart, there will be required more Time for its Extruſion, than when the Quantity of *Lentor* is leſs; and therefore a leſſer Quantity will ſooner paſs thro' the Veins than a greater, and conſequently will the *Lentor* ſooner again on this Account return into the Capillaries; but becauſe when this *Lentor* is thruſt out of the Arteries into the Veins, it is divided every Way in the Cohæſion of its Particles, which ſeparately float in the Current of different Magnitudes; and becauſe there cannot be any Certainty in theſe Conditions, and that every one of them drives along the Superficies of the Veſſel, againſt which they are protruded by the *Impetus* of the ſubſequent Blood, the greater therefore they are in Bulk, the more Surface the Blood will have to ſtrike againſt, in Order to drive them towards the Heart; and the ſhorter they are in their tranſverſe Diameters, the leſs *Momentum* will the Current have upon them; whence on theſe Accounts it will come to paſs, that the Velocity of the *Lentor* through the Veins may be greater, when it is increaſed in Quantity, than when it is diminiſhed; if therefore the Stay or Retardation of the *Lentor* in an increaſed Quantity, in thoſe capillary Arteries where it adheres, is as the Velocity of an augmented Quantity paſſing through the ſame Capillaries, ſo reciprocally the Retardation of this through the Veins, will be as its Velocity through the ſame; and conſequently the Time of their whole Circuit equal, or the Paroxyſms will return at the ſame Diſtances; but of the Retardation through the Arteries to the Velocities, is not reciprocally, as its Retardation to its Velocity in the Veins, the Times will not be equal; and the *Lentor* of an increaſed Quantity will return ſooner or later than that of a diminiſhed Quantity.

The ſame in a diminiſhed Quantity.

After the ſame Manner we ſhall demonſtrate, that the *Lentor* of a diminiſhed Quantity may return ſooner or later, or at the ſame Time as the *Lentor* of an augmented Quantity; for in like Manner as the *Lentor* on its Extruſion out of the Arteries is divided into Parcels of greater or leſſer Magnitudes, will its Facility to Motion thro' the Veins be greater or leſſer, whence, according to the ſame Reciprocation, or as the Proportions of the Velocities and Retardations are to one another, will the Times of the whole Circuit be the ſame or unequal, and conſequently the Returns of the Paroxyſms be ſyncronical, or ſooner or later, in the *Lentor* of a diminiſhed Quantity of Blood, as in that of an increaſed one.

That Lentor *which leaſt deviates from a natural State of Blood returns firſt.*

From theſe Conſiderations it appears, that the *Lentor*, whoſe Tenacity is ſo reduced, that it comes neareſt to the natural Fluxility of the Blood it ſelf, will finiſh its Circuit the ſooneſt; becauſe this will more eaſily, that is, by fewer Contractions of the Heart, and in a leſſer Space of Time, be forced out of the Arteries, and carried into the Veins; againſt whoſe Superficies it will hardly make any Stops; and therefore as its whole Circuit is compounded of the Times of its Progreſs through both theſe Canals, and thoſe Times are both ſhorter than in a greater Degree of Viſcidity, the Returns of the Paroxyſms muſt be quicker.

A more viſcid Lentor, *tho' not in ſo great a Quantity, will return more ſlow.*

And, on the contrary, it is manifeſt from the ſame Conſiderations, that when this *Lentor* is yet more tenacious, craſs, and adhæſive, its Return will be more ſlow, even although it is not ſuppoſed ſo much in Quantity; becauſe in this leſſer Quantity it may happen to ſpread it ſelf like a moſt fine Webb, againſt the Superficies of the Veins, ſo that its Altitude, that is, the Quantity of Surface for the following Blood to ſtrike againſt, ſo as to carry the *Lentor* on forward, will be leaſt, and both its Dilatation in Reſpect to its Quantity, and its Force of Cohæſion greateſt, for that by Suppoſition is augmented; the *Lentor* therefore that is ſuppoſed more tough, although it ſubſiſts in a leſſer Quantity, will be ſlower in its Returns.

The Times of Return greater or leſſer.

But becauſe the Time wherein this *Lentor* paſſes out of the capillary Arteries, through the Veins, Lungs, and Heart, to its Return into them again, is the Sum of its whole Circuit, and this neceſſarily depends upon its Velocity, chiefly through the Veins, which is in Proportion to its greater or leſſer Cohæſion with their Superficies; the Times therefore between every Return will be ſhorter or longer, in Proportion to the greater or leſſer Quantity of ſuch Cohæſion, and its greater or leſſer Reſiſtance to that preterfluent Stream which endeavours to waſh it away along with it.

In the firſt Place then it is to be obſerved, that the Length of the Canals through which this *Lentor* is to be carried,

ried, is not to be eſtimated from the ſimple Longitude of the moſt direct and ſhort Diſtances between the Heart and extreme Parts, for this will take Place only in the Longitude of a greater Vein ſtretched out from the Heart to the Extremities, in the moſt direct and ſhort Diſtance poſſible; but it is to be conſidered ſuch as it really is, a thouſand Times deflected and reflected, implicated, twiſted, and branched into an innumerable Diverſity of Turnings and Canals, in the ſame Manner as in Fact all the Blood-Veſſels are diſtributed; and therefore as from ſuch an Implication and Diviſion, that Longitude, which otherwiſe would not be ſo extended, is ſtretched out into a vaſt Diſtance, that whole Length which the *Lentor* hath to conquer, in its Reaching to the Heart and Return into the Arteries, will not be very ſhort.

Secondly, When it gets through the Arteries into the Veins, it comes into a very large Capacity, that yields to its Protruſion without any new Diſtraction; whence the *Lentor* is not agitated by a Power greater than that of its Cohæſion, and whereby it is thrown off from the Veſſels when it comes into Contact with them, and made continually to change its Poſture, as it happens in the Arteries; therefore ſore the Force of the flowing Stream cannot eaſily carry along with it the *Lentor* when thrown into the Veins, unleſs the Reſiſtances of its Cohæſion is overpowered by its proper *Impetus*, which will not be only difficult, by Reaſon of that retarded Velocity with which the Blood flows in the Veins, as before obſerved, but alſo on many other Accounts.

For becauſe, in the third Place, the Parts of coherent Fluids, ſuch as are all thoſe which are viſcid, do more eaſily ſlip over one another on all Sides, than they can be totally ſeparated in thoſe Surfaces whereby they cohere, therefore the preterfluent Stream ſtriking againſt any larger Portion of *Lentor*, will ſo affect it in its conſtituent Parts, that thoſe which are moſt remote from Contact with the Superficies of the Veſſels, and neareſt to the Axis of the Canal, will be ſtruck over others, ſo as in a Manner to be turned round them; whence they will recede more towards the Superficies of the Veſſel, and extend the whole viſcid Maſs into a longer and more depreſſed Form, until at length it is ſtretched into Contact and Cohæſion along the whole Surface of the Canal, before the other Parts of the ſame Viſcidity, which were at firſt neareſt to its Superficies, can be ſhook from their Contacts; and which they can by no Means loſe, but by a Force ſuperior to that whereby thoſe Parts of the *Lentor*, moſt prominent towards the Axis of the Canal, are turned from their Directions, and which can hardly be ſuppoſed to ſubſiſt in a Velocity equal to that of Blood in the Veins, and more eſpecially if the *Lentor* is very tenacious: And for this very Reaſon will it come about, that the *Lentor*, which otherwiſe, when diſpoſed into thicker *Moleculæ*, would be eaſier to move forward, will, when ſpread out into a more depreſſed Form, and a greater Extenſion of Contact, become leſs fluxile; and when this Kind of Extenſion is of ſuch a Nature, as may be conceived like a Web lining the inner Membranes of the Canals, the Force which the circulating Blood can impreſs upon it will be but very little, and the whole Power it has to Motion muſt neceſſarily depend only on a very ſmall Faculty of Compreſſion, whereby the Coats of the Veins can a little ſhift their Contacts with the adhering *Lentor*, and thruſt it ſo far into the Current, that the Blood may have a ſmall Force againſt it. Nor can the Progreſs of this *Lentor* be forwarded by any gravitating Faculty, or any other Power imaginable in it to draw it from its Cohæſions; for the Force of Gravity in ſuch ſmall Portions of Matter, is always leſs than that of their Cohæſions, ſince even the larger Drops of Water, a Fluid not by much ſo viſcid as here ſuppoſed, do neither change their Figures, or fall off from the Branches of Trees, or any other Bodies on which they looſely hang; and the Power of Gravity hath yet leſs *Momentum* in Matter circumſtanc'd as in the Caſe before us; for when a Perſon is lying down, no Effect can be the Reſult of this Property, even in Fluids that have no Cohæſion with the Veſſels in which they circulate; and the ſame may be ſaid of any other diſtractile Faculty.

Fourthly, The Difficulty of Separation will be increaſed, becauſe by this rotary Motion the *Lentor* will be divided in its Superficies that are direct and parallel to the Veins, and ſpread into a thinner and broader Form; and the Labour of dividing it in thoſe Contacts, which are perpendicular to the Veſſels, and when it is in Adhæſion with them, may well be conceived from what hath been already ſaid: But if any one would more fully apprehend the Difficulty of breaking a *Lentor* thus circumſtanced, and ceaſe entirely to wonder at it, let him obſerve that any viſcid Matter, collected in no great Quantity, and put under the Influence of its own Gravity againſt any Superficies that is even ſmooth, ſuch as Glaſs, *&c.* will hardly change its Poſture for many Days together; and ſometimes not at all, if in Suſpenſion it grows more viſcid and leſs in Quantity; nay, let him remember that even the cleareſt Water will hang in very narrow Tubes, ſo as not to be eaſily ſhaken from thence either one Way or other, but by a very conſiderable Force; and in the laſt Place let it be taken Notice, that there are naturally in Being ſome Humours, whereof one or two Ounces will not paſs much ſhorter Canals under the Space of eight or more Hours, as *De Graef* hath himſelf obſerved of the *Pancreatick* Juice, one Ounce only of which he was able to collect in that Time, and of *Bile* two Ounces in the ſame Space; from all which we judge it ſafe to conclude, that as the Force of Adhæſion to the Canals is greater or leſſer, with Regard to a more or leſs viſcid *Lentor*, the Times of its Returns will be one, two, three, or more Days.

Between the Paroxyſms the Patient to Appearance is well.

Becauſe then the whole *Lentor* is at laſt waſhed out of the capillary Arteries, they will therefore be reduced to their natural Capacities, and the Blood will flow through them in its natural Quantity, without any Cauſe that ſhall more than naturally compreſs, comminute, and diffuſe its Heat; that is, in its whole Circuit through them the Blood's Heat will be at its natural Standard. But becauſe the looſened Heat eaſily perſpires, its Quantity will on this Account diminiſh, and as it flows in the Veins, Part will waſt this Way, and Part be entangled in the common Maſs, as before obſerved; for that Diminution of Velocity the Blood flows with in the Veins, hinders its further Comminution, and facilitates ſuch a Union; nay, the Heat is eaſily hereby admitted into the groſſer Combinations, wherein its Activity is greatly reſtrained, and its Perception on that Account much diminiſhed. Moreover, ſince a conſiderable Space of Time paſſes between each Paroxyſm, the whole Maſs during that Space flows many Times through the Lungs, and is therefore more blended and incorporated again with its igneous Particles; on theſe Accounts the Blood will become of a more natural Diſpoſition, from whence all Things will reſult as in a natural State, and the whole Body be, or ſeem to be, as in a Time of perfect Health; although it will not in Reality be ſo, becauſe the peccant Humour yet remains in the Veins, and what is able again to diſorder the Conſtitution, will ſoon return into the Arteries, and excite a Perception of Cold, with all its *Concomitant* Affections, ſo that the Diſeaſe and its Cauſe is yet in Being in the Veins.

But not always neceſſarily ſo.

But although this may often happen, by Means of the great Diſtance between the Returns, yet it does not always neceſſarily prove ſo; for if the Heat meets with greater Obſtruction in Tranſpiration, either from too viſcid a State of Blood, or from too great a Straitneſs of the Pores, or from the Heat's Incorporation with Particles too fixed, and unfit for perſpiring, or from any other Cauſe of the like Nature, or if the Blood is ſo fuſed and diſſolved by the Heat ſucceeding a cold Fit, that by the ſubſequent Maſs it cannot be reſtrained, nor naturally blended as it paſſes through the Lungs, the Heat will then freely exert its Activity, and the Body will remain in a Temperature hotter than natural, until the *Lentor* is re-accumulated in the capillary Arteries, ſo as to renew the cold Fit.

A Multiplicity of Returns, and in the ſame Order.

For Brevity Sake then and Perſpicuity, let this *Lentor* be ſuppoſed of ſuch a Nature, that it returns every third Day, it is manifeſt that it was removed on the ſecond Day, but lay concealed, and ſlid along the Superficies of the Veins, without being able to give any Perceptions of its Exiſtence; on the ſecond Day therefore the Blood is ſo vitiated, that it can ſupply again the ſame *Lentor*, that is, one of ſuch a Nature as ſhall appear again on the third Day; and this new *Lentor* ſhall again on the ſecond Day from the Attack of the former, be derived into the capillary Arteries, and occaſion a Cold equal to, or greater, or leſſer than the foregoing, as this ſecond Supply ſhall be circumſtanced like unto, or different from that; and if this again makes its Way into the Veins, juſt as the preceding is entering the Capillaries, there will be a cold Fit produced again the third Day, with all the *Concomitants* of that in the firſt Day; and if again another Supply of *Lentor* accumulates a fourth Day in the capillary Arteries, there will be produced the ſame Effects as from that returning the ſecond Day.

And even between all theſe Reduplications, the Body ſhall ſeem well.

And this alone may ſuffice to ſhew, after what Manner the Reduplications of the Fits may be circumſtanced, of what Kind ſoever they be, whether returning every Day, every third, every fourth, or ſeldomer, and from hence it is alſo poſſible, that a cold Fit may return oftener than once in a Day, in ſuch Manner, that every Paroxyſm may anſwer to the ſame Paroxyſm, which re-

returned the preceding Day at the ſame Time. But although in all theſe Reduplications, of what Kind ſoever, whether of thoſe recurring every Day, every other, or every fourth, or ſeldomer, by Reaſon of the Shortneſs of Time between every two ſucceeding Paroxyſms, the Blood can but very little recover its natural State; yet in Proportion to its Deviations into Diſtemperature, and its Re-comminution and Digeſtion, may it for a very ſhort Time be reſtored, inſomuch as to give the Appearances of perfect Health; but this does not neceſſarily happen, nor eaſily.

Reaſons for Diverſity in Returns.

From the foregoing it appears, that the Times or Intervals between every two Paroxyſms is in Proportion to the Degrees of Tenacity in the peccant Humour, and this Tenacity is determined by the Quantity of aqueous Humidity mixed therewith; when therefore it happens that more or leſs of this Humidity is waſted or abſorbed from the *Lentor* in any one given Circuit, its Return will be proportionably ſooner or later, according to ſuch a Conſumption, and as the Remainder is thereby rendred more or leſs fluxile, or ſuſceptible of Motion; whence if the ſuppoſed Return ſhould be every Day, it will afterwards grow ſeldomer, for Inſtance, every other Day, or every third Day, as the *Lentor* is become more dry and leſs fluxile; but if there be mixed therewith, or is generated any Humidity further to dilute the *Lentor*, and reduce it to the Fluxility of natural Blood, its Return will be either altogether cut off, or it will become more frequent. Since therefore in the Circuits of theſe *Lentors* to the Capillaries, while they are protruded towards the Veins, and the Heat yet remains in Vigour; and again protruded into the capillary Arteries, where the hotter Parts are waſted, the moſt fluid Part of the *Lentor* may be attenuated and evaporated, and more eſpecially when the Heat is moſt intenſe; ſo that it dries away all the Moiſture, and makes the Remainder of the Viſcidity in the Veins more tough, and leſs moveable, which therefore ſhall not finiſh its Circuit, and return in leſs than every third or fourth Day. Again, on the other Hand, becauſe the *Lentor* obſtructs in the Capillaries, and the Heat continually ſtrives to diſengage it ſelf therefrom, ſome Parts of this *Lentor* may be ſubdued and fermented; that is, reduced into a more liquid State, to which it will yet further approach, when it is conveyed through the Lungs, and acted upon in Reſpiration; as therefore the *Lentor* ſhall from theſe Cauſes be circumſtanced, and rendered more fit for Reduction, Fermentation, and Solution, or for the Separation of its more fluid Parts from thoſe which are more tenacious by the Contractions of the Veſſels, through which it is carried, the Returns will be determined, and changed from *Quotidians* into *Tertians* or *Quartans*, or from *Quartans* into *Tertians* or *Quotidians*, or Reduplications of either.

From the ſame Lentor *may happen Death chiefly in the cold Fit.*

Let there be then ſuppoſed ſuch a Quantity of *Lentor* reſiding in the Blood, that it cannot be diſcharged through the capillary Arteries into the Veins, although it be in a ſmall Quantity, yet of ſo ſtrong a Cohæſion, that it cannot be ſeparated from the Coats of the Veſſels; the Maſs therefore cannot finiſh its Circulation, whence in a ſmall Time the whole Body muſt grow cold, the Blood will not paſs into the Muſcles, nor will it arrive at the Brain, or elſe there ſtagnate, whence there will be no Secretion of Spirits to flow into the Nerves, and conſequently a Privation of Senſe; and when the *Lentor* and its Obſtruction is ſuppoſed ſo obſtinate, that it cannot poſſibly be got forward in the Arteries, the Motion of the whole Maſs of Blood muſt irreparably ceaſe, that is, (which is the ſame Thing) there Death will enſue. And as all this happens when the *Lentor* is in the Arteries,

ries, that is, in its Return, Death will more generally happen in the cold Fit: But if the *Lentor* is paſſable through the Arteries, and the Body is afterwards parched with a great Heat, which exhauſts the Blood of all its Spirits, and exhales it; or where the Heat is not ſo intenſe, and proves more moderate, yet if it finds a Blood defrauded of Spirits, by preceding Paroxyſms, or a Blood that has a few Spirits, but ſuch as are exhalable by a ſmall Heat, Death will happen not at the Attack of the cold Fit, but ſooner or later after it; and it will the ſooner happen in a Scarcity of Spirits, becauſe they will not only diſſipate by a ſmall Heat, but alſo naturally ſpend themſelves in the Motions both of the Body and the Mind. Death therefore will for the moſt Part, and moſt eaſily, happen in the Re-accumulation of the *Lentor* upon the Capillaries, that is, in the cold Fit, but this not always neceſſarily.

The Lentor *attended with Heat, not wholly carried out of the Capillaries.*

In the ſecond Place be it ſuppoſed that a *Lentor* returns attended with Heat; this then as the other ſtops in the Capillaries, but yet in ſuch Manner, that the natural *Impetus* of the Blood, and its Preſſure againſt the Arteries remaining, the Heat will get diſengaged, and the Arteries never be quite obſtructed; and this Heat will continually be breaking

ing looſe from the ſtagnating *Lentor*, and paſſing into the Veins: From the ſucceeding Blood therefore it comes about, that as it finds a Paſſage in ſome Meaſure open, the *Lentor* which at firſt ſtopped will be leſs compreſſed, whence neceſſarily, in the firſt Place, that which is moſt moveable and expreſſible, as the Heat is, will be firſt carried into the Veins; Secondly, ſince that which already ſtops is leſs crowded by the following, part of this will find an open Paſſage through, and by Means of ſuch a leſſer Compreſſure will the adhering *Lentor* continue in its Contact with the Veſſels; yet that which is not quite hardened by a Conſumption of its Humidity, and rendered altogether unfit for Motion, will even by ſuch a leſſened Compreſſure be ſeparated from the dryer Parts, and carried into the Veins; and ſomewhat like to this will happen in every Kind of *Lentor*; which, in Proportion to its greater or leſſer Facility to Motion, will recur every Day, every other, or every third Day, and ſooner or later finiſh its Progreſs through the Veſſels. This Separation of a leſſer Viſcidity from that which is more obſtinate, is the neceſſary Reſult of a diminiſhed Compreſſure, as it manifeſtly appears from the abſolute Conditions in Separation of any Viſcidities from Particles with which they are mixed; and this Separation is circumſtanced, as the recurring *Lentors* with Heat are diverſified in their Conſiſtances to the whole. For that is moſt unfit for Motion, and moſt dry, which remains ſticking to the Arteries, after its more fluxile Parts have eſcaped from it; and becauſe a diminiſhed Compreſſion, or Protruſion, occaſions the Arteries to be leſs diſtracted outwards, as ſoon as the Heat and more fluid Parts are got into the Veins, their Reſtitutions and Contractions inwards will be very weak, and conſequently not able to ſhift their Contacts with the remaining *Lentor* that is ſo difficult to move, whereby it will continue in Cohæſion with them, and grow yet more faſtened thereto, by the continual Waſt of the thinner Parts, until it is impoſſible to move it by the whole Force of the circulating Current.

Its Returns the ſame as the Lentor *with Cold.*

But becauſe from the adhering *Lentor* there is ſeparated a Viſcidity, yet ſomewhat more moveable than that which is moſt dry, in Proportion to its Degrees of Fluxility will its Returns into the ſame Capillaries be every Day, every other, or every third Day, as was before explained of the *Lentors* returning with Cold; for this flows thro' the ſame Veſſels, and ſlides with a very ſlow Pace along the Coats of the

Veins, with all the other particular Circumſtances as there ſingly enumerated: And on every Return it cannot but aggravate the Heat, when it arrives to the narroweſt Part of the Arteries, where, by Means of that dry *Lentor* which lines the inner Superficies all round, it cannot but be more crowded, and have more Heat compreſſed out of it, as above explained already.

Why between the Returns the Body not left well.

But ſince this dryer Part of the *Lentor* continues in Contact with the capillary Arteries, the ſubſequent Blood muſt always be kindled into a greater Heat than natural, by the greater Compreſſure and Straitneſs of the Paſſages, whence it will rarifie and inflame ſo much, as never to leave the Body quite free: Add to this, the Conſideration of its Dryneſs, Adhæſion, and Inaptitude to Motion with the common Stream; alſo the Want of it there to incorporate with, and reſtrain the Activity of, the hot Particles of the Blood, whereby their Motions are more inordinate in themſelves, inſomuch that they cannot be blended with others by Reſpiration as they paſs through the Lungs, and eſpecially for Want of thoſe groſs, dry Corpuſcles, which are moſt fitted to entangle them in their Pores, and reſtrain their Activities.

Hence Death chiefly in the Return, From this Heat it may come about, that all the remaining Humidity in the Blood may be attenuated and exhaled, and the whole Maſs become more rarified, hot, moveable, readier for Perſpiration, and more unfit for the Generation of new Spirits; whence in the Returns it is yet more comminuted by the dry *Lentor* which adheres, whereby at laſt it becomes ſo ſubtle and active, that it exhales by Tranſpiration all the remaining Spirits from the Blood, whereupon very eaſily, and moſt commonly, enſues Death; but this does not always *but not always neceſſarily.* happen at this Time neceſſarily, becauſe the like Exhalation and Conſumption of all the Spirits may happen after the Return; when, through Intenſeneſs of Heat, the whole Maſs is thrown into a Fervor, ſo that the Spirits partly evaporate, and are partly ſpent by muſcular Motion, and the Paſſions of the Mind; and this the ſooner is effected, if the Blood is much diminiſhed in Quantity, or has before been defrauded of its Spirits, as hath been already explained when Death happens upon a *Lentor* attended with Cold.

Multiplicity and Change of Returns. When therefore the Returns of this *Lentor* with Heat happen in the ſame Order as the Returns of a *Lentor* with Cold, it is manifeſt that with *this* there may be the ſame Multiplicity of Returns

turns ſucceeding one another in the ſame Order as with *that*, according to the preceding Account; and alſo that they may be alternately interchanged in ſuch Manner, as after a Fit every Day returning, others may ſucceed every ſecond, third, *&c.* as above enumerated.

The Change of a Lentor *with Cold, into one with Heat, and* è contrà.

Let the Blood therefore be now ſuppoſed in ſuch Circumſtances, that the *Lentor* which ſeizes with Cold be ſo far broke, that by the natural *Impetus* of the circulating Blood its Heat may be diſengaged from it; ſuch a *Lentor* therefore will be divided into Particles very moveable, ſuch as thoſe of Heat are; and into others leſs ſuſceptible of Motion, which therefore will greatly accumulate in the Capillaries with Diſpoſitions not to excite a Senſe of Cold, but of Heat; and ſuch a Kind of Solution as this will not be difficult to obtain either by Means of a Fermentation, or a greater compreſſive Force, in ſuch a Degree as may be ſufficient to extricate the Heat, and what is of a more fluid Nature, and yet leave the more viſcid and dry behind, in cloſe Contact with the Veſſels. But during this Mutation, the Body will not be left entirely free as in perfect Health, nor will the natural Functions be duly performed, whence the Blood will grow more fuſed, and the Spirits will evaporate beyond Reparation, by which Means ſuch a Change is the moſt threatning of Death. But, on the other Hand, in a Viſcidity producing Heat, if its moſt tenacious Parts adhering to the Arteries be fuſed by Fermentation, and ſo looſned that it can be ſeparated from them, and again mixed with the Blood, ſo as to occaſion a new *Lentor*, which ſhall bring on a cold Fit; the Body will be left entirely free for ſome Space of Time between the Returns, the Spirits will be recruited, and Health will enſue, or a perfectly natural State.

A Return of Lentor *with Cold, between every Return of* Lentor *with Heat,* &c.

Laſtly, Becauſe in a *Lentor* producing Heat, there always adheres ſomewhat to the Arteries, which is its dryeſt Part; and therefore a *Lentor* producing Cold will either flow through, or ſtop in the Cavity *that* leaves, ſo that if the Blood is ſo vitiated, while this dryeſt Part adheres to the Capillaries, that it generates a Viſcidity which entangles the Heat, then muſt enſue a cold Fit, until ſuch a cold viſcid can be got through into the Veins; and to force this through into the Veins, a Quantity of Contraction will be ſufficient, which is not ſo for forcing away the moſt dry Part of a *Lentor* producing Heat, becauſe that adheres more cloſely; nor will ſuch an adhering *Lentor* be more thinner, or at all torn away by the cold Viſcidity crowding through its Cavity, by any other Cauſe than this ſame Preſſure, which being leſs than the Reſiſtances from its Cohæſion, will yet leave it in Contact with the Veſſels, after the viſcid *Lentor* producing Cold is got thro' into the Veins, and conſequently will there be a Return of Cold between every Return of a hot Fit; and on the contrary.

Repetitions of the Cold.

But it is not only thus very probable, that between every Courſe of Heat there may be alſo a certain Return of Cold, but alſo that this Cold may return more than once in ſuch an Interval; for when the *Lentors* producing Heat are once mixed with the Blood, and their moſt active Parts quite diſengaged from the Entanglement of other leſs moveable, it may eaſily happen that many of theſe latter may ſo accumulate in the Capillaries, as to exclude or ſuppreſs the Perception of Heat there, which Senſe of Cold will again reſtrain the Blood's Current into the Veins, and its Return to the Arteries, whence will proceed a Diminution of Spirits, or a Suppreſſion of them, or a weakned Contraction of the Heart, and conſequently an univerſal Perception of Cold all over the Body: whence appears the whole Propoſition.

PROPOSITION XX.

This Lentor *which produces Cold may be generated in the Blood, without the Introduction of any Foreign Particles into it; and this generating Principle muſt be ſomewhat either very viſcid, or very liquid, but fitted to cauſe a* Lentor, *and that without any Foreign Influx into the Blood, either by a Diminution of its Motion, or Quantity; and from a Repetition of either of theſe Cauſes it comes about, that after a* Lentor *is generated, which recurs in a certain given Time, another alſo may be produced recurring at certain Periods between every Attack of the former; and on an Increaſe alſo of the Blood's Motion, or Quantity, may the ſame Cold be generated. But for the moſt Part, and with leaſt Difficulty, will this* Lentor *producing Cold, and frequently recurring at certain Periods, either in one or another Part of the Body, and as ſoon again diſappearing, happen upon the Omiſſion of uſual Exerciſes, or Labours; upon a Suppreſſion of the groſſer Perſpirations, if there are any ſuch from the Blood; a Suppreſſion of Evacuation of that which is viſcid in it ſelf, or able to turn the Humours into Viſcidity,* *whe-*

whether natural, or contracted by Cuſtom; upon a prohibited Separation of viſcid Humours from the Blood, or if they are ſeparated, a Prevention of their Secretion into their proper Canals; and other Cauſes of the ſame Kind. By an Influx of Saliva, *or Viſcidity through the OEſophagus and Stomach, or of the* Mucus *of the Inteſtines, or of the Pancreatick Juice or Bile, ſince all theſe may be mixed with the Blood, or of Chyle or Lymph, becauſe every one of theſe ſingly or jointly may become more viſcid, or if they are never ſo fluid, but diſpoſed ſo to coagulate the Blood, that its Heat may be entangled in its* Lentors, *or of any other Humour, ſtagnating by Obſtruction or Compreſſion in any* Viſcus, *and derivable into the Blood's Current after any Space of Time. But whether this* Lentor *generating ſuch a Series of Affections, that recur in the ſame Order as already explained, be occaſioned with or without any Influx of Foreign Matter, there will from it ariſe theſe two material Diſtinctions, the firſt is, where the original* Lentor *is not wholly ſpent in the firſt ſingle Circuit, but recurs oftener, as already explained; and the other where it is quite waſted, but the Cauſe producing it yet ſo ſubſiſts, as to generate a freſh Quantity after a certain Space of Time; and whether this Cauſe producing a new* Lentor *does it* *by acting immediately upon the Blood it ſelf, or by ſupplying it with viſcid Particles from without, thoſe Conditions of its Motions cannot be deſtroyed, which we have demonſtrated neceſſary to the Repetition of its periodical Returns. Laſtly, Although there are certainly ſuch Particles as will communicate a Senſe of Cold by their Motion, and that of this Kind may be imagined that Ferment mixed with the Blood, which produces the cold Fits at the abovementioned Periods; yet this Ferment cannot act ſo as to excite a Senſe of Cold, but by reſtraining the Heat's Activity, and running the Blood into a* Lentor; *whence from whatſoever Cauſe that Series of Affections already enumerated does ariſe, and its Forerunner the cold Fit, there can none happen without an Accumulation of* Lentor *in the Capillaries, unleſs ſuch a Ferment reſtraining the Heat's Activity can be aſſigned, which does not at the ſame Time produce a* Lentor *in the Blood, but either keeps it in its natural State of Fluxility, or by ſome Means or other ſo comminutes it, as to render it thinner; and where ſuch a Ferment does ſubſiſt, there will recur the ſame Series of Affections as before recited, without the Accumulation of a* Lentor *in the Capillaries. In like Manner a* Lentor *may be found in the Blood which in its Exertion is accompanied*

panied with Heat, without the Influx of any Foreign Matter into it; and this may be either in ſuch a Degree viſcid, as will ſuffer the Heat to be ſet looſe from it, or indeed very liquid, but ſo diſpoſed to fuſe the Blood, that its Heat may exhale from it, and its other Parts rendered thereby leſs fit for Motion; and this from an increaſed Motion, or an increaſed Quantity of Blood; and by both theſe it may happen, that after a Lentor *is produced which recurs at certain Periods, another may be generated that ſhall recur in the Intervals of the former; and moreover may there be given a Heat frequently and ſuddenly recurring with Intervals of Cold, from an Increaſe of Exerciſe, or bodily Labour, beyond what is cuſtomary, from a ſuppreſſed Perſpiration of thoſe hot Particles, which ſhould exhale from the Blood, a Detention of hot Excrements, and ſuch as heat the Blood, either naturally or beyond a natural State; a Detention of hot Humours in Combination with thoſe conſtituting the Blood, or if they are diſengaged from ſuch Union, a Stoppage to their Derivation into ſuitable Canals, and all other Cauſes of like Nature: But by an Influx as at firſt ſuppoſed, the Reverſe, of what was ſaid concerning the Production of Cold, will happen, and concur in the Generation of Heat.*

Be-

A Lentor *with Cold from a diminiſhed Motion of the Blood.*

Becauſe by Heat the Blood is, ſo far at leaſt, fuſed, that the Parts between which the Heat acts and moves cannot cohere together, the Heat of the Blood will be increaſed by its Motion; from a Diminution of Motion therefore in the Blood, its Meaſure of Heat will decreaſe, and conſequently that Power by which the Blood's conſtituent Particles are kept from Cohæſion; wherefore a *Lentor* under this Circumſtance will be more eaſily generated, and that of ſuch a Nature, as will entangle the Heat; that is, a Senſe of Cold will be produced, ſince the *Momentum* of the Blood's Motion is ſuppoſed leſs than natural; and therefore by a Diminution of Motion in the Blood, will there be generated in the Veſſels a *Lentor* producing the Senſe of Cold.

The ſame from its Diminution in Quantity.

But becauſe in Proportion to a Diminution of the Blood in Quantity, there will be the leſs Heat at Liberty, or to be ſet at Liberty, when therefore the Blood is leſſened in its natural Quantity, its Heat will be leſſened, and a *Lentor* will be generated with a Senſe of Cold, the Generation of which will be rendered the more eaſie, if its diminiſhed Quantity is propelled by the Heart with a weakned *Impetus*; and this for the moſt Part happens in a leſſened Quantity of Blood; for in this Circumſtance the Blood will be leſs comminuted, and will not be thrown to ſuch great Diſtances, by that Force which it obtains wholly from the Heart; and moreover as the Blood is ſuppoſed under a Diminution of its Quantity, the Arteries will be leſs thruſt outwards, the Brain will be leſs compreſſed, a leſs Quantity of Spirits will be derived into the conſtituent Fibres of the Heart, whence they will contract more weakly, and the Blood will be propelled with leſs *Impetus*; and laſtly, this very *Momentum* of Contraction in the Heart will yet be rendred more weak, becauſe, by Means of a diminiſhed Quantity of Blood, there will be leſs of a nervous Fluid ſecerned, and a leſſer Quantity of it derived into the Cells of the contractile Fibres.

After one, another may be produced, recurring in the Intervals of the former, and both from the ſame Cauſes.

From both theſe Cauſes therefore may a *Lentor* be generated, which will be accompanied with a Senſe of Cold: If the Blood, for Inſtance, be drawn away by Phlebotomy in a large Quantity, ſo as to ſink the Spirits, by an Hemorrhage from the Noſe, hemorrhoidal Veins, Womb, or the like; or by large Purgation, Salivation, Emiſſion of Seed, Conſumption of Spirits, a violent Compreſſion of the Brain, from what Cauſe ſoever, or by any other Means di-

diminiſhing the Blood in Motion or Quantity, a *Lentor* will be generated producing a Senſe of Cold; which Cold will not however be perceived, until the *Lentor*, after the Manner above explained, comes to accumulate in the capillary Arteries: But becauſe that other *Lentor*, before generated, hath in this Interval paſſed out of the ſame Arteries, and is now for ſome Space of Time making its Progreſs through the Veins, therefore this new generated *Lentor* will not flow along in Company with that, but follow it, and conſequently will *that* firſt finiſh its Circuit, that is, will return back again into the Capillaries before *this* can again arrive at them, whereby there will ariſe alternate Returns of both *Lentors:* The whole of which makes it manifeſt, that of two *Lentors* recurring at different Times, their Circuits may be kept diſtinct, and their Returns attended with all the enumerated Circumſtances.

The ſame Lentor *alſo from an augmented Quantity of Blood, but its Alternations of Heat and Cold more ſudden, and frequent.*

Let it on the other Hand be ſuppoſed, that the Blood exceeds its natural Quantity, the Arteries will be then crowded, whence the Blood will flow with more Difficulty, and be more compreſſed; whenſoever therefore ſuch Compreſſion is in any Part of the Body ſo great in any given Space of Time, that during that Space the Heat cannot

not get diſengaged in that particular Part, then there will be perceived a Senſe of Cold, and that ſuddenly; but becauſe ſuch Preſſure increaſes and ſpreads, the Heat will at length get at Liberty, either by Reaſon of an invigorated Compreſſure it ſelf, or by Means of its Duration, wherein the Blood undergoes a longer Attrition, and conſequently diſengages the Heat from it. The ſame to this alſo happens upon an increaſed Motion; for as the natural Velocity of the Blood is accommodated to its natural Quantity, whereby within a given Space of Time it can finiſh its deſtined Circuit through its Veſſels, when therefore its Motion, that is, its Velocity is increaſed, it will happen that within that natural Time a greater Quantity of Blood than is natural will enter into thoſe Veſſels, whence it will be retarded; and as in its Stay the Heat will be reſtrained in the Part loaded with it, ſo there will in that Part ariſe a Perception of Cold; becauſe further in this interim, thoſe narrow Canals are paſſable at leaſt to ſome Parts of the Blood, while other Parts in ſome Meaſure ſtagnate, that which paſſes will be the leſs compreſſed, and will the leſs entangle its igneous Particles, whence they will ſoon make their

Eſcape, and diffuſe all round a Perception of Heat.

From Intermiſſion of Exerciſe. Becauſe by Agitation of the Body all its Viſcidities are comminuted, broke ſmaller, and changed into perſpirable Particles, where therefore a Perſon has been accuſtomed to ſuch Exerciſes, as after this Manner perſpires the groſſer Humours out of the Habit, upon their Intermiſſion, or total Omiſſion more eſpecially, all groſs Humours and Viſcidity will accumulate in theſe Veſſels, from whence otherwiſe it would make its Eſcape, if by Action it was ſhook away; by the Mixture therefore of ſuch Viſcidity the Blood will become thicker, and generate a *Lentor* producing Cold, if ſuch *Lentor* can entangle and reſtrain the igneous Particles.

Suppreſſed Perſpiration, &c. The ſame to this will alſo manifeſtly happen from a ſuppreſſed Perſpiration of the viſcid Parts of the Blood, if any ſuch naturally perſpire from it as can reſtrain its Heat from Exertion; the like from ſuppreſſed Purgation of the Blood-Veſſels, as of the *Menſes*, Hemorrhoids, *&c.* as ſuch are viſcid, or able to render the Blood ſo by a Suffocation of its Heat, and this whether they are natural Diſcharges, or acquired by Diſtemperature and Cuſtom.

Suppoſe again ſome viſcid Humours, the Bile for Inſtance, to be by ſome

Cauſe or other rendred incapable of Solution and Separation from the Blood in the Hepatick Veſſels, and that this will obſtruct the Diffuſion of its Heat; the Blood therefore when in Union with ſuch an Humour muſt be thicker, its igneous Particles will be entangled, and a *Lentor* will be produced cauſing Cold: Nay, let it again be ſuppoſed, that this is capable of Separation from the Blood, but that it cannot be ſecerned into its proper Canals by Reaſon of Obſtruction, Compreſſion, or the like; it will then be carried away by the Blood's Current, and apt to render it thicker and colder; when therefore it is thus ſeparable in the Liver, but for Want of Secretion carried with the circulating Blood into the Habit, it will cauſe a *Lentor* and Senſe of Cold.

A Lentor *producing* Cold *in the Blood, without the Influx of any Foreign Matter.*

From all theſe Conſiderations it therefore appears, that a *Lentor* producing a Senſe of Cold may be generated in the Blood, without the Introduction of any Foreign Matter into it; but further may a *Lentor* be generated which will produce a Senſe of Cold, from an Influx of Matter into the Blood from without, that is, when ſuch Matter is viſcid and ſuited to entangle the igneous Particles, or even if it be in it ſelf very fluid, but diſpoſed to generate a viſcid Blood: And this Derivation cannot be made but from Canals emptying themſelves into the Blood-Veſſels, and there are no other of this Kind but the Thoracick Duct and Lymphaticks; and theſe only therefore can convey any ſuch Viſcidity into the Blood, or any Matter diſpoſed to run it into Viſcidity, that is in it ſelf very fluid. Through theſe Canals is derived a Lymph, and the Chyle with ſuch Principles as enter into its Compoſition, and which have already been hypothetically enumerated; if therefore by Means of any unnatural Affection of the Blood, or of the nervous Juice, from whence the Lymph is derivable, or by Means of ſome Affections in the Inſtruments, which ſeparate the Lymph from the Blood and nervous Juice, that Humour becomes viſcid, or fluxile with a Diſpoſition to change the Blood into Viſcidity, and depreſs its Heat, or to render the Chyle with which it mixes of a more viſcid Nature; upon its Derivation into the Blood again there will be a *Lentor* occaſioned in it, which will produce Cold. Suppoſe then any *Viſcus* compreſſed, obſtructed, *&c.* ſo that its proper Juice is ſecerned more viſcid than natural, and which cannot by Reaſon of its Viſcidity be conveyed into the Current of the Blood in the Trunk of the *Vena Cava*, but in a certain Space of Time, and when there, be ſuited to depreſs the Activity of the natural Heat, there then will be a *Lentor* generated in the Blood producing a Senſe of Cold; and even if this Humour, in a diſtempered State, ſhould be moſt fluid, yet apt to coagulate the Blood, it will have the ſome Conſequences: And therefore from all this is it manifeſt, by what Means this *Lentor* may, and will, be generated in the Blood, and how it will produce a Senſe of Cold.

A twofold Reaſon for Returns.

Whether this *Lentor* is generated with, or without the Influx of any Foreign Matter into the Blood, the Cold cannot return periodically with all the enumerated Affections in their Order, unleſs the ſame *Lentor* recurs after a certain Space of Time; and therefore is it an Argument, that it hath either been not totally ſubdued, or totally ſo, and diſcharged out of the Body by ſome excretory Outlett, or reduced again into the perfect Nature of Blood; but the Cauſe which produces the firſt *Lentor* will produce another in the ſame Space of Time, recurring with the ſame Affections, to be after the ſame Manner ſubdued, and reduced into the Nature of Blood within the ſame Compaſs of Time, whence there will be a double Source of the Returns of Cold, as is manifeſt from the Premiſes.

A Way to account for the Returns, without that great Retardation before-mentioned.

I do now come to ſhew how theſe Returns may happen, without that great Retardation in the Motion of the *Lentor* within the Veins, as was ſuppoſed in the *preceding Propoſition*; but that ſuch Retardation cannot be avoided upon a Return of the ſame *Lentor* is manifeſt from that Propoſition. In the ſecond Place therefore let any two Returns be ſuppoſed, (that is, for Inſtance, recurring at the ſame Hour every Day; for the ſame Reaſon will hold for all others recurring at longer Intervals of Time) and the firſt of theſe produced from a *Lentor*, which ſhall be totally ſubdued, by Expurgation, or Change into Blood, in the Space of one Day, that is, within the Space of one whole Circuit; but the ſecond from a *Lentor*, that ſhall be juſt the ſame in Quantity and Quality, as that which produced the firſt: I ſay, firſt of all, that either of theſe *Lentors*, and any other returning in the ſame Hours, and finiſhing its Circuit in one Day, may ſucceſſively, and by Degrees, be accumulated in the Blood-Veſſels, ſo that gradually, and in very minute Particles, it may either flow into, or be generated in them, until it excites a Senſe of Cold, and all its *Concomitant* and *Subſequent* Affections. For becauſe to the Excitation of Cold with all its Attendants, it is neceſſary that the *Lentor* ſhould ſtop in the Capillaries, and not in one or another only, but in many together, it is alſo neceſſary that the Quantity of this *Lentor* ſhould be conſiderable, and ſo far conſiderable as to be able to reſtrain the Heat and natural *Impetus* of Circulation, and likewiſe obſtruct in the Arteries, which it cannot do unleſs its Quantity be ſo great that it cannot be incorporated with the Blood, and freely circulated through the Arteries. This conſiderable Quantity of *Lentor* therefore is either wholly generated in the Blood-Veſſels, which appears to be poſſible, or is wholly derived into the Blood from without, which alſo is practicable; nay, it is demonſtrable that this very Quantity is gradually inſinuated into the Blood-Veſſels, or therein gradually generated, and therefore is it poſſible that ſomewhat is a whole Day accumulating either in it ſelf viſcid, or generating Viſcidity, but in ſo ſmall a Quantity that it requires the Compaſs of a whole Day to become conſiderable enough to excite Cold with all its Attendants. Suppoſe then the Seizure of a cold Fit be at the Cloſe of the Day, for Inſtance, and that there is a new Return of the ſame *Lentor*, accumulated in the Space of another whole Day; if this *Lentor* can be ſubdued totally within the Space of the following Day, and in the mean time another *Lentor* be accumulated in the Blood in equal Quantity, there will be again a third Return, and ſo on in Order; not by the ſame *Lentor* recurring into the Capillaries by a very ſlow Motion, but from a new *Lentor* ſucceeding another wholly ſubdued: And this Subduction is effected ſooner or later, according as the different Natures of the *Lentors* will admit of their Solution by Heat in the Augmentation and Height of the Paroxyſm, or of thoſe Bodies which are incorporated therewith. Becauſe therefore this *Lentor* is ſuppoſed to be ſucceſſively and gradually accumulated, ſo that a whole Day paſſes before it is arrived to its full certain Quantity, every ſingle Particle added to the Blood in every Point of Time, may be carried on with the uſual Celerity of Circulation, and conſequently will there not be any of that Retardation of *Lentor* in the Veins, as above recited in the foregoing Propoſition.

This Lentor *may be carried many Times through the Lungs without Alteration.*

But becauſe the full Quantity of *Lentor* ſufficient to bring on a Fit is ſuppoſed to be accumulating for a whole Day, therefore within the ſame Space of that whole Day will this *Lentor* paſs many thouſand Times through the Lungs, with the other *Viſcera* and Parts of the whole Body; which perhaps may be thought more ſtrange than that great Retardation mentioned in the preceding *Propoſition*, but yet ſeveral indiſputable Facts do entirely remove this Difficulty; for who is it that knows not how long the Milk of thoſe who give Suck, and the Urine of many Perſons will retain a particular Smell, much beyond the Space of one Day; and the Flavours of *Aſparagus*, *Smallage*, *Garlick*, *Caſſia*, *Rhubarb*, alexipharmick Oils, Oil of *Turpentine*, and the like, are irrefragable Proofs, that ſomewhat from ſuch Subſtances does paſs the manillary and renal Glands without Alteration; and very often too muſt it paſs through the Lungs, wherefore in like Manner may this *Lentor* take its Courſe in Circulation through them, many thouſand Times, without undergoing any Change. What is more notoriouſly known than the Poiſon of a mad Dog to continue in the Body 30 or 40 Days before it diſcovers it ſelf, and ſometimes longer? This is without Doubt all the while mixed with the Blood, and how many thouſand Times muſt it then circulate through the Lungs within the Space of forty Days, or ſo long as it lies without Exertion, and yet not be changed? Somewhat like this therefore happens in the aſſigned *Lentor* of a Fever, as may beyond Contradiction be made appear.

Thirdly, By a continual Accumulation of a *Lentor* of this Nature within the Blood-Veſſels, immediately after an Attack of the Fit, there may be occaſioned freſh Attacks and Circuits that are *ſimple*, but not *compounded.* The firſt Part appears from what hath been already ſaid, but in Order to underſtand the ſecond, it is neceſſary to know, that from whatſoever Cauſe ſo much *Lentor* is accumulated in the Blood, 12 Hours for Inſtance after a Return, as is ſufficient to excite a Perception of Cold, with its uſual Attendants, it muſt be either a new Viſcidity from ſome Part of the Body, and in Plenty, or ſome Liquid ſuited to coagulate the Blood into ſuch a *Lentor*; when therefore this *Lentor* flows through the Arteries, it is mixed with that other *Lentor* which otherwiſe would not have brought on a new Paroxyſm under 24 Hours; wherefore from both is compounded a freſh *Lentor*, which jointly will bring on a Perception of Cold within 12 Hours, and will be wholly waſted. During therefore this Concourſe, after the new Attack of that *Lentor*, which otherwiſe would bring on a Paroxyſm but once in 24 Hours, unleſs ſome Part of it be waſted in the Compaſs of the remaining

Simple *but not* compounded *Fits from ſuch a* Lentor.

ing 12 Hours, there will be accumulated but half of that *Lentor* as is required to bring on a Fit every Day, and therefore 12 Hours more are to be expected for finiſhing ſuch an Accumulation as is neceſſary for an every Days Fit; whence the third generated *Lentor* is diſtant from the ſecond 36, and the ſecond from the firſt 24 Hours, whereas in compounded Paroxyſms, every two Fits alternately correſpond to one another. But if after thoſe 12 Hours that *Lentor* again recurs which was ſuppoſed to recur the firſt 12 Hours, and half of that ſhould alſo be expended in a Fit, there would then be produced a new Order of Returns and Circuits recurring every half Day; and thoſe will be more aggravated, in Conſideration they are raiſed by a *Lentor* exciting a Fit once a Day, and one exciting a Fit every half Day together.

The Returns uncertain or regular.

From hence it appears, in the fourth Place, that all Returns are regular, diſturbed, or in no Order at all, anſwerable to the Accumulation of *Lentor* in the Veins, or a coagulating Liquid, as that is collected equably or uncertainly in its Quantity or Quality. For after a *Quotidian*, for Inſtance, let a Quantity of *Lentor* be ſuppoſed to accumulate ſufficient to excite a Fit in 12 Hours, there will then therefore be given a new Return of half a Days Period, immediately after the Attack of this, or ſome Hours after the Accumulation of that *Lentor* is ſuppoſed to begin, which being heightened to a certain Quantity, may produce a daily Return and Circuit; and this fit Quantity of *Lentor* will be accumulated within that Compaſs of Time, which is computed from the Beginning of its Accumulation, to 12 Hours after the Attack of a half Days Fit; a Return therefore will be produced anſwering to the preceding *Quotidian*; after the Termination of which, if ſo much *Lentor* be generated within the following 12 Hours, as hath been accumulated for the Attack of a Fit between every *Quotidian*, (whether ſuch Accumulation be made equably through that Space of 12 Hours, by Degrees and ſlowly, or altogether at once, or in a leſſer Number of Hours, and a ſhorter Space of Time only) 12 Hours after the Attack of the *Quotidian*, will another Attack be in Readineſs anſwering to that which came on 12 Hours before that *Quotidian*, or there will be a Circuit compounded of thoſe two ſingle ones, and anſwering alternately to the *Quotidians* from one 24 Hours to another. But if there is not given this exact Order of Time, the Returns will anſwer to one another un-

uncertainly, or in no Order at all, as the *Lentor* producing them is accumulated uncertainly, or in no Order. But as a certain Quantity of *Lentor* is required to the Production of a new Fit, if therefore it is accumulated in an uncertain Time, its Quantity alſo muſt be uncertain, that is, in no certain Condition, ſometimes greater, at others leſs, more or leſs viſcid, or fluxile, and in no certain Condition of Quality, which all neceſſarily contribute to this that the Quantity ſufficient to bring on a Fit is accumulated in an uncertain Space of Time.

The Accumulation of this Lentor *regularly or not, from procatarctick Cauſes, or*

Fifthly, Theſe Accumulations are poſſibly produced either regularly or not; and as they reſult from procatarctick Cauſes acting upon the Blood, ſo as to change it into a *Lentor*, ſuch *Lentor* will be generated, and accumulated in the Veins regularly or not, as ſuch procatarctick Cauſes do certainly or uncertainly act upon the Maſs of Blood; ſo that if Cold, or any Humidity hindering Perſpiration is perceived at any particular Hour, from which it goes on for 24 Hours, we ſhall then labour under ſuch Indiſpoſition ſo long, and the Fit will be a *ſimple Quotidian*; but if after the firſt Fit either Cold or Humidity occaſions a Re-accumulation of *Lentor*, ſuited in like Manner for the ſame periodical Returns, there will then be produced a *double Quotidian:* But if a *Lentor* of another Kind be generated, the Returns and Circuits will be of another Kind; and as Cold and Humidity operate in a certain Time, and according to their Efficacies in the Production of *Lentors*, at different Intervals, or appearing at different Times, as they are in greater or leſſer Quantity, or more or leſs viſcid, there will reſult a Complication of Circuits and Returns, either regularly, or in any imaginable Uncertainty. The ſame will alſo happen from an Augmentation or Diminution in the Motion, or Quantity of the Blood, and the like Affections as above explained.

From an Influx of Lentor.

But the like happens by Accumulation, whether from an Influx of *Lentor*, or of a coagulating Liquid generating a *Lentor:* As ſuppoſe, for Inſtance, in the firſt Place, ſome conſiderable Portion of the bilious Duct to be obſtructed, either totally, ſo that its whole Cavity is filled up, or only in Part; in the natural Flux of the Blood then from the *Porta* into the *Cava*, the whole Quantity of Bile that is naturally ſecerned, cannot paſs through Canals leſs previous than natural, and therefore part of it will flow through the capillary reducent Veins towards the Heart: But ſince the Capacities of theſe are fitted only to the Circulation of Blood through them, they will therefore be too ſtrait to admit of the Paſſage of Bile through them; and as this is viſcid, the ſame contractile Force cannot paſs it through thoſe Capillaries, with an *Impetus* natural to the Blood, but much ſlower, whence it will adhere, and by a continual Current of freſh Blood and Bile be accumulated in thoſe narrow Canals to a great Quantity, whence at length it will be wholly waſhed away into the common Stream, after it hath received ſo much Preſſure from the following Blood, as is ſufficient to ſeparate its Cohæſions with the Veſſels, and then it will bring on a Fit of Cold. If then this Obſtruction continues in the bilious Ducts, and there is required the Space of one, two, or three Days for ſuch an Accumulation in the Veſſels, as will increaſe the compreſſive Force enough to ſeparate its Cohæſion with their Coats; after ſuch Times therefore there will recur the like as happened in the firſt Fit, and there will follow others regularly returning, and terminating in their Circuits. Let the bilious Particles then be ſuppoſed to be obſtructed only in Part; during ſuch a partial Obſtruction therefore leſs

Bile will flow through the Veins; and if this obſtructed Bile cannot then be continually waſhed away with the circulating Blood, but will remain in the Ducts, there will be a longer Time requiſite for its Accumulation in Quantity enough to cauſe its Separation from the Veſſels, by their increaſed Contractions, than when it obſtructs in greater Quantity; becauſe ſuch a leſs Quantity gives greater Reſiſtance to that tranſverſe Force which ſhould looſen its Cohæſions with the Veſſels; and when it is ſeparated from thoſe Contacts, there will yet be required a longer Time for its Accumulation, ſince it muſt flow from the Arteries into the Veins of the whole Body, in the ſame Manner as it flows with the Blood through the Veſſels of the Liver. Wherefore it is to be expected, that as long as the bilious Ducts are reobſtructed, there ſhould happen Returns of Paroxyſms, and that regularly or not, correſpondent to the forementioned Circumſtances, as the Obſtruction is greater or leſſer, or the ſame with that whence the foregoing had their Origin.

But if in the ſame Liver there ſhould be ſome other conſiderable Portion of the bilious Ducts obſtructed, after the Manner as already explained, but that ſuch Obſtructions are ſometimes

times ſooner and ſometimes later, yet both in the Liver at the ſame Time, it is manifeſt that from both theſe Obſtructions there will accumulate a *Lentor* in the Veſſels, but that the firſt *Lentor* will ariſe from the firſt Obſtruction (ſuppoſing the Quantity of Obſtruction, and the compreſſive Powers to remove it be equal) and the following from what happens after; and therefore will there be Returns and Circuits compounded of both, which will regularly anſwer to one another, if thoſe Obſtructions are not changed in their Conditions; but if they are irregular, theſe will happen alſo irregularly; if they now happen, and then are removed, the conſequent Paroxyſms will alſo correſpond therewith: But theſe Obſtructions will orderly recur, while there remains the ſame Quantity of Blood, the ſame Qualities, and the ſame compreſſive Powers, for while theſe ſubſiſt, there will be yielded the ſame Quantity of Bile, to be conveyed through its proper Ducts, and therein obſtructing until the contractile Powers of the Veſſels can again force it away; when therefore either the Quantity or Quality of the Blood, or the external Compreſſure of it from the contractile Veſſels, are not the ſame, there will not be the ſame Propenſity to Obſtructions, nor will the compreſſive Powers be urged to conquer them within the ſame Periods, and therefore will there be no Regularity, when ſometimes very much, at other very little, and at other no Bile at all flows through the Veins, and conſequently makes the ſubſequent Paroxyſms very uncertain. And it eaſily appears how in a natural State, as well as a diſtempered one, the Quantity and Quality of the Blood, and the Compreſſion of the Muſcles of the Abdonen, and thoſe aſſiſting Reſpiration, may continually be changing; and if all theſe Diverſities can happen from the Affections of one *Viſcus* only, what may we not expect from an Affection of many *Viſcera* together? And that this may be the Caſe is very certain, eſpecially where there is ſome Change in the whole Maſs of Blood, whereby only vitiated Humours can be ſecerned from it, which generate Obſtructions in the Canals and Glands. Concerning this Kind of *Lentor* therefore the Caſe is very plain.

From the Influx of a coagulating Liquid.

And in the ſame Manner does it happen from a Liquid that coagulates the Blood into Viſcidities: In the firſt Place then, let the ſame be put as before concerning the Obſtruction of one *Viſcus* only, and a Portion of Bile returning through the Veins, be ſuppoſed obſtinately to adhere to them, ſo that it cannot but with Difficulty be got away, and requires for that Purpoſe a daily and forcible Compreſſion; from ſuch Compreſſion therefore will that which is moſt liquid be ſeparated from the more adhæſive Parts, and carried into the Veins of the whole Body; where then ſuch Liquid, as amounts almoſt to the Subtilty of Spirit, is ſuited to generate a *Lentor* in the Blood, it will generate it, and bring on a Senſe of Cold with all its Attendants; and here it is convenient to remark, that ſuch a Liquid will either generate a *Lentor*, as ſoon as it comes into the Blood, in which Circumſtance it will immediately occaſion a Paroxyſm, or it will require ſome Time, and repeated Circulations, before it can make ſuch a Change in the Blood, or upon it ſelf, or both; and if theſe are neceſſary, then the Attacks of the Fits will proportionably be delayed. This *Lentor* however from hence at length comes into the Veins, and there is a Paroxyſm produced by it, which will not be ſucceeded by any more, but by the ſame Obſtruction and Adhæſion in the Hepatick Veſſels. And as it appears from what hath been already ſaid, that ſuch Attacks depend upon the Obſtructions, and thoſe Obſtructions upon the Influx of a coagulating Fluid, therefore ſuch Inſults or Attacks will be regular or not, in Proportion to the Regularity or Irregularity of the influent Liquid. And from hence it moreover appears, that all theſe enumerated Affections may enſue, not only from many Obſtructions at the ſame Time in the ſame *Viſcus*, but even from one ſingle Obſtruction; and that this one ſhall be able to bring on all the Paroxyſms, either by its own *Lentor*, or the Communication of a coagulating Liquid expreſſed from it, or by both together, where the more viſcid Part can be carried along with the Current out of the Hepatick Veſſels into the common Maſs. But where this happens to many *Viſcera* at the ſame Time, the Conſequences will be yet more eaſily effected, in a great Diverſity of Returns, either with Regularity or not.

But becauſe, Secondly, this Liquid is ſuppoſed to generate a *Lentor* that cannot be found in a natural State, it muſt therefore be generated either from a vitiated Blood, or from diſtempered *Viſcera*, or both; if therefore the Blood is not always in the ſame Manner vitiated, or at leaſt equably, neither can this Liquid be equably generated; and in like Manner if the Diſtemperature in the *Viſcera* is not always the ſame, the coagulating Fluid cannot be always regularly and equably produced: And that the Blood may be vitiated in a very different Manner and Degree, is demonſtrable from the Actions of the Mind and Body, Meats and Drinks, and a thouſand of the like Circumſtances; and the Diſorders of the *Viſcera* conſiſt chiefly in a Change of their external Compreſſions, and the Velocities of their Contents in different Capacities, and which by Obſtructions, Inflexions, and Compreſſions of their Veſſels, may be diſtempered a thouſand Ways. Neither on this Account only, from a regular or irregular Generation of a coagulating Fluid, will the Paroxyſms be regular or not, but alſo becauſe this Fluid, when it is brought into the Blood, may require many Circulations with it before it can change any Part of it into ſuch Viſcidity, and which, according to the different Qualities of the Blood, (which is much varied by Diet, Exerciſe, Medicines, *&c.*) will be effected ſooner or later, equably or not, as that more or leſs deviates from its natural State. But if the Derivations of this Fluid be from many Parts of the ſame *Viſcus*, and they happen not all at the ſame Time, or if it be in the ſame Manner circumſtanced from divers *Viſcera*, there will enſue a Multiplicity of Returns, either regularly or not, as was before explained of a *Lentor* immediately derived into the Blood. From the whole therefore it is manifeſt, that whatſoever hath been ſaid concerning the Generation of a coagulating Fluid, whether by a Fault in the Blood, or *Viſcera*, or both, may alſo, and ought, to be aſſerted concerning the Production of that *Lentor*, from whence, independently of thoſe Diſorders, we have deduced the Returns of the Paroxyſms, *&c.*

How the ſame from the Chyle.

Thirdly, If it is poſſible for the Chyle, or any other Juice that is to paſs into the Blood, to be generated in a natural State, when the Blood it ſelf is diſtempered, (which it is difficult to admit of, and dangerous to aſſert) and that this natural Juice, when it comes into the Blood, is changed into a Viſcidity, or a coagulating Liquid, there will then from hence alſo be excited regular or irregular Paroxyſms; for if the Blood be always in ſuch a certain Degree of Diſtemperature, and the Juice flowing into it always of the ſame Nature, there will always be the ſame Interval of Time requiſite to change this natural Juice into an unnatural State, which Time may be one, two, or three Days, *&c.* but if either of theſe, or both, are of different Natures, the

Courſe of the Periods will be changed, and the Paroxyſms become irregular: But if this natural Juice be derived at different Times from the ſame or different Parts, and immediately in the ſame Intervals of Time acquires a diſtempered State, from a diſtempered Blood, there will enſue a Multiplicity of Returns regularly or not, as ſuch Derivations are in like Manner circumſtanced; but if ſuch Juices are of different Natures, that is, conſiſting of Parts of different Properties, every one requiring different Spaces of Time to the Production of a *Lentor*; or if they are unequably viſcid, there will be a Multiplicity of Returns altogether uncertain, and in no Order at all: From all which we at length conclude, that in theſe ſeveral Ways of generating a *Lentor*, or a coagulating Fluid, there is avoided that wonderful Retardation in the Veins, as was explained in the foregoing *Propoſitions.*

Hence no Retardation of the Lentor, *as before explained.*

But to proceed, becauſe from ſharp Sounds only a Senſe of Cold may be excited, as with the Noiſe of a Mill, the Poliſhing of Braſs or Metals with an acute hiſſing Sound, as is made by the turning of Wheels, and which will give a Shivering, and ſet the Teeth on Edge; now Sound is a Motion of the Body, and therefore Occaſions may be

A cold Ferment may be mixed with the Blood, ſo as to excite Cold, and produce a Lentor.

given, wherein by Motion a Senſe of Cold may be excited without the Suppoſition of any *Lentor* præexiſting in the Blood. If therefore ſome Fluid, whoſe Motion gives the ſame Modification to the Perception as theſe Sounds, comes in ſuch Manner to be mixed with the Blood, that it does not thereby loſe its Energy, there will then be excited a Senſe of Cold without any præexiſting *Lentor*. But here we muſt allow, that although ſuch a Fluid, or frigoriffick Ferment, may mix with the Blood, and excite a Senſe of Cold, without any præexiſtent *Lentor* in it, yet the Conſequences of its Exertions will be a Viſcidity and Coagulation of the Blood, unleſs ſomewhat hinders it. Now becauſe this Ferment is ſuppoſed to excite a Senſe of Cold, therefore its Energy conſiſts only in deadening theſe natural Tremors of the Nerves, by which Heat is propagated, or in giving ſome other Tremors contrary thereunto; and the Quantity of Tremor in the Nerves from Heat, is as the Quantity of Motion in the igneous Particles; where therefore ſuch a Ferment hath a Power of deſtroying this Tremor, or giving a contrary one to the Nerves, it cannot but be much more able to ſtop the Activity of the Heat it ſelf: And becauſe by Heat the groſſer Parts of the Blood are kept from Cohæſion, where therefore that is reſtrained and rendred inactive, the Blood will coagulate, and run into a *Lentor*, (for that Blood that is found fluid in a Carcaſe, is either watery, diſtempered, or putrid) as Experience does evidently teſtifie, and likewiſe that natural Blood will coagulate with Cold. When therefore the Blood is coagulated by this Ferment, there will be Returns of Cold, with all the Attendants of a Paroxyſm.

But becauſe the Blood's Fluxility may not perhaps altogether ariſe from Heat, or although it does ariſe from Heat in a natural State, and there may be ſomewhat that is not natural to it found, which, when mixed therewith, will preſerve it fluxile and liquid, as Salt will hinder its Coagulation, and yet reſtrain its Heat at the ſame Time, ſo that the ſame Salt makes it liquid and cold at the ſame Time; hence if ſuch a Ferment can be found that will reſtrain the Heat, and preſerve the Blood in a State of Fluidity at the ſame Time, then there will be Inſults of Cold without a *Lentor* in the Blood: But that the ſeveral *Concomitants* may follow which always attend upon Cold, it is neceſſary that by this Cold the Blood be thickened, ſo far as to render the Pulſe weak, depreſſed, and ſmall, by

How a frigorifick Ferment may be mixed with the Blood that will keep it fluid at the ſame time.

too ſparing a Separation of Spirits; but this increaſed Thickneſs is in ſuch a Manner that comports with its greater Viſcidity, but not ſo as to make it conſiſtent or hard, for a Thing may be rendered thicker, that is, its Parts may be brought nearer together, and under a greater *Niſus ad Contactum*, without reaching into an intimate Cohæſion, on which Cohæſion the very Eſſence of Conſiſtency or Hardneſs depends; and of which Species is a *Lentor*. It is moreover neceſſary, that the Blood ſhould continue in this State as long as the cold Fit continues, on the Termination of which likewiſe the Heat neceſſarily breaks out, ſo that there is an Augmentation of its Perception, and it is in a higher Degree than in a natural State; and this will certainly come to paſs when ſuch a Ferment, which is able at firſt to ſuppreſs the Heat, is gradually ſubdued, and the Blood grows more fluxile, ſo that the igneous Particles at length break out with great Force; but this at firſt is rendred the more difficult, becauſe the Debility of that Motion, when joined with a Perception, may go ſo far as nearly to generate a *Lentor* in the Blood.

And therefore Paroxyſms with Cold, without a Lentor *in the Capillaries.*

As to the Order wherein the Cold arrives to the ſeveral Parts, more or leſs, with all its uſual Attendants, it does neceſſarily depend upon this Ferment, as will eaſily appear from the Demonſtration of the *eighteenth Propoſition.* Theſe Conditions therefore being given, there will be generated a Series of Paroxyſms coming on with Cold, and all the other *Concomitants*, without a *Lentor* adhering in the capillary Arteries; all which we undertook to demonſtrate in the firſt Place.

The ſecond Part of the Propoſition appears from the Demonſtration of the firſt; for all thoſe Things which are ſingly enumerated and demonſtrated in *that*, are to be affirmed and proved after the ſame Manner in *this*, by changing the *Lentor* with Cold, into a *Lentor* with Heat; and the Attacks of this may in like Manner be made appear to recur, not only by ſuch a *Lentor* returning with a very ſlow Motion thro' the Veins into the Arteries, but by its total Conſumption in every Paroxyſm, the Heat and Agitation of the Blood remaining till a new Fit, which will be occaſioned by a Re-accumulation of a freſh *Lentor* in the Blood, generated either within its own Maſs, or derived into it from without, with all the Diverſifications from regular, ſimple Paroxyſms, to the moſt compounded and irregular; and in like Manner may it be ſhewn, how Paroxyſms with Heat are the Reſult not of a *Lentor*, but a Fluid ſetting the Heat at Liberty, without any neceſſary Conſequence of a *Lentor* afterwards in the Blood; whence the whole of this ſecond Part is made appear, and conſequently is the whole *Propoſition* demonſtrated.

COROLLARY.

Becauſe it is therefore poſſible for Returns of Fits with Cold or Heat from the ſame *Lentor*, often returning through the Veins into the Arteries, it is poſſible alſo for the ſame to be produced when it is waſted in every Fit, by a Re-accumulation of a new *Lentor*, in like Manner for every Fit: If therefore a Caſe is given, wherein every Paroxyſm is the Effect of a new *Lentor*, in Conjunction with a *Lentor* that is in the mean Time generating another Fit, or which of its ſelf would produce another by its Remainder in the Blood, there will hereby be eaſily brought about a Multiplicity of Returns, either regularly or not, in Proportion to the Times of Mixture between the recurring *Lentor* and the accumulating new one; and the Multiplicity and Irregularity of theſe Returns will be the greater, where the Accumulations of new *Lentors* are at different Times, from different Parts, and of different Quantities and Qualities.

PROPOSITION XXI.

The particular Symptoms which are neceſſarily produced in the Body, from both the Diſorders of the Blood above explained; that is, a Lentor *which begins its Attack with Cold, and one that comes on with Heat.*

Although it is demonſtrated in the laſt *Propoſition*, that the Inſults of Cold and Heat, with thoſe *Concomitants* above enumerated, may ariſe from a Liquid producing ſuch Affections without any *Lentor* in the Blood, therefore if we were regularly to enquire into the Conſequences of both, any one would juſtly think the ſame way of reaſoning to hold good, touching the ways of producing both Cold and Heat, that is to ſay, what would follow in the Body when Cold comes from a *Lentor*, and what when from a coagulating Fluid, or a frigoriffick Ferment, and in like manner muſt we proceed concerning the Affections of Heat; but becauſe what we have hitherto examined, and what we are now going about to enquire into in this preſent *Propoſition*, is only ly in order to explain the Nature of a Fever; that it may therefore be more plain to us in the following *Propoſitions* from its *Antecedents*, *Concomitants*, and *Conſequences*, we ſhall rather chooſe to fix its Origin in a *Lentor*, than a coagulating Fluid; and hence we ſhall have nothing more to be ſatisfied in, than what are the Conſequences of Cold and Heat from a *Lentor*, but not from a Liquid. And becauſe therefore, whether Heat follows a cold Fit, or whether it comes of its ſelf without any preceeding Cold, the Heat is always of one and the ſame Nature, and of the ſame Exertion and Operation, conſequently that Heat is not to be ſeparated, and as it were diſtinguiſhed, when it ſucceds a cold Fit, from that Heat which comes on without Cold, as to its manner of Operation; and therefore from both will reſult the ſame Affections, and nothing elſe will call for our Conſideration, than Cold and Heat, and what neceſſarily happens in the Body all that while the Cold and Heat laſts, whether the latter ſucceds the former, or happens without it.

From Cold in the Head. If then the *Lentor* which ſeizes with Cold is ſo viſcid, that it cannot be diſſolved by a Thouſand Occurſions in the Contactions of the *Pia Mater*, a leſſer

Quantity of Spirits will be ſeparated from the Blood, and this leſſer Quantity may be in ſuch a Degree, as is not ſufficient for the Performance of the ſenſible Functions, or hereby will be produced Spirits naturally more ſluggiſh, on which Account only they will be more unfit for the Offices of Senſation; or if the Quantity of Spirits ſeparated in this Circumſtance be greater, or very near, or quite equal to a natural State, where the *Lentor* is mixed with an aqueous Humidity, ſo that the Brain is too much moiſtened, or the Nerves grow flaccid, from the Nature of Senſation it is manifeſt, that from all theſe Cauſes the Body will be as in a State of Sleep, and therefore a Perſon ſeized in ſuch manner with Cold in the Head, will be thought to ſleep; which will alſo the ſooner happen, becauſe the Patient ſeeming to ſleep will be moved with greater Difficulty, thro' a defect of Spirits, or thro' their weakened Energy, from too great a Participation of *Lentor*, and an aqueous Humidity: But one thing will happen from this Circumſtance yet much more ſtrange, and that is a trembling, or ſhaking of the whole Body, under that very Appearance of Sleep, which is nothing elſe than the Tremor before explained from an uncertain and unequal

An Appearance of Sleep,

and trembling.

Influx of a Fluid through the Nerves, and of Blood into this or that Muſcle.

Stupor of the Mind. From this very Cauſe is produced a Stupor of the Mind, that is to ſay, as often as there happens a diminiſhed Quantity of Spirits, or when they become more watery or viſcid; for after the ſame Manner as the Waves or Flux of Spirits, at the Time of Senſation, is interrupted in the Nerves in any particular Circumſtance, they will alſo be diſturbed in the Brain; and as they are neceſſary to the Operations of the Mind, the Mind cannot in ſuch a Circumſtance act, or will be ſtupify'd; and this all the while the Inſtruments of external Senſation are in their natural Order. *and external Senſation.*

On the contrary it may likewiſe eaſily happen, that one or all of the external Senſes may be diſordered, or quite deſtroyed, while the Mind continues in its natural Powers, and regularly exerts its rational Operations: For ſuppoſe this *Lentor* by any Accident ſhould be accumulated in a greater Quantity upon this or that Artery, or upon any *Plexus* or Complication of Arteries, and that theſe Arteries are likewiſe inflected, implicated, and wraped about thoſe Nerves which are diſtributed to the Organs of Hearing, Sight, or Taſte, *&c.* In ſuch a Caſe therefore the ſame

Arteries will grow more obſtructed by a continual Afflux of new Blood, and their Coats will be more thruſt outwards; and the Nerves within their Contacts or Implications will be more compreſſed, inſomuch that at length, by a continued Accumulation, the Nerves will be wholly cloſed, and the Paſſage of Spirits through them entirely cut off; or their Flux may be hindered, without a total Stoppage of the Nerves. Hence therefore it comes about, that a Perſon ſuddenly loſes his Hearing, his Sight, or his Taſte; but upon a Termination of the cold Fit, thoſe Senſes as ſuddenly return again, becauſe the *Lentor* is then forced through into the Veins.

From the ſame Neceſſity it appears *A Palſy.* that a Privation of Motion may happen in this or that Muſcle, without any Regularity or Certainty, whereſoever there is a Defect of animal Spirits from the ſame Cauſes, or the Blood is ſo forcible penned up in the Arteries of this or that Muſcle, that none of it can get into the ſmall Fibres conſtituting thoſe Muſcles.

A *Delirium* may alſo happen from *A* Delirium. the ſame Diminution of the Spirits in Quantity, for in ſuch a diminiſhed Quantity there will not be enough to continue the uſual Waves through the

Nerves, or to repeat their natural Vibrations, whence they will leap into Irregularities, and excite in the Brain incoherent Species, that is, there will be a *Delirium.* The ſame will happen where the Spirits are ſeparated of too active a Nature, by the too forcible Compreſſion of an aggravated *Lentor*, for ſuch of themſelves will ſtrive and leap in all manner of Directions, and excite this or that Species at Uncertainty, or by Accident; the like alſo if ſuch an obſtinate *Lentor* occaſions a Stagnation in the Brain, that its Membranes as it were grow ſtiff and tenſe; and in the time ſuch Tenſion is made, there will be actually ſome Species excited; in that Part of the Nerves therefore which is ſhook by the Motion of thoſe Species, there will be leſs Tenſion and Stiffneſs; whatſoever Spirits therefore remain after the Tenſion of the Nerves, a Motion will eaſily be excited in them ſufficient to the Production of that Species which gives leaſt Reſiſtance thereunto, or there will be produced a *Delirium.*

A Phrenſie. But if a greater Quantity of *Lentor*, or a leſſer Quantity, with an aggravated Viſcidity, accumulates upon the Brain, ſo that it cannot be diſſolved, or broke away into the Veins, either by the following Blood, or the proper *Niſus* of its own Particles endeavouring to diſengage themſelves and diſperſe, there will happen a greater Preſſure of the Arteries outwards, or a more ſenſible Diſtention, continuing even after the Cold; and from the Expiration of that Period, with a Succeſſion of Heat, and an Afflux of ſwifter and hotter Blood, if this Viſcidity cannot be yet diſſolved and broke away into the Veins, this Diſtention will ſtill become greater, and the Part more hot; that is, there will be an Inflammation, or a Phrenſie, whoſe Origin was from Cold.

Pain in the Head.

Hence will eaſily follow Pain in the Head, with a Senſe of Tenſion, Throbbing, Weight, and Pricking; and ſuch Tenſion will ariſe from the *Lentor* obſtructed in the Arteries, that is, from its Protruſion and Diſtention of them outwards; the Throbbing from a Hindrance to the Paſſage of the affluent Blood by the obſtructed Viſcidity, which makes it more perceptibly thruſt againſt the Arteries, through which it ſhould flow; the Weight from a greater Accumulation of *Lentor*; and the Pricking, when with the *Lentor* any Thing is mixed that is ſharp and vellicating.

Watching.

But in ſuch an unnatural State of the Blood as this, where it is joined with a *Lentor*, or diſpoſed to Viſcidity, either nutritive Particles will not be generated in it, or ſuch as are not wholly natural; and moreover as from that Heat which ſucceeds the Cold, all the aqueous Humidity, which is not only nutritive, but alſo lubricating to the ſolid Parts, is conſumed, from both which Sleep is produced, therefore even during the cold Fit will Watching continue.

Hemorrhages. Suppoſe further this Obſtruction from *Lentor* to be very obſtinate in ſome Veſſel either within or without the *Cranium*, ſo that the affluent Blood thruſts very hard againſt that very Artery, it will be forced in ſome Meaſure to recoil, and preſs againſt the next Arteries on all Sides; whence if its greateſt *Impetus* happens againſt a Part naturally or accidentally weak; that is, conſiſting of ſuch very thin Membranes, as are not able to withſtand its *Impetus*, that Part will be broke through, and the Blood flow out, or there will happen an Hemorrhage; and as ſuch an Artery chances to be in the Ears, Eyes, *&c.* the Hemorrhage will be upon thoſe Organs; and after the ſame Manner may there be made a Rupture in that very Artery where the *Lentor* is obſtructed, if it cannot reſiſt the Force of the affluent Blood.

Inaptitude to Motion. Suppoſe again the *Lentor* to be ſo great, that it even fills the Arteries in the Brain, and that it be ſo obſtinate and adhæſive in its own Particles, that it cannot be broke by a thouſand Occurſions in the *Plexus's* of the *Pia Mater*; and if from hence it comes that no Spirits flow through the Nerves, either becauſe they cannot be generated in ſo viſcid a Conſtitution of Blood, or altho' they may be generated in ſome ſmall Quantity, becauſe they cannot be ſecerned into Canals quite ſhut up, in this Circumſtance there muſt be an intenſe Cold through the whole Body; for the *Lentor* will be in the higheſt Degree obſtinate and adhæſive, with a Suppreſſion of Motion and Senſation, or the Body will be as a dead Carcaſe; it will become rigid and ſtiff, ſo as not eaſily to be moved in its Joints, with a Congelation of its aqueous Humidities, and a Contraction, and Tenſion of all the Solids from the ſame Cold; Reſpiration will be ſuppreſſed, and the Heart's Motion, ſo far that the Blood cannot be agitated nor kept in its circulatory Motion, whence there will be an eaſie Change into Death it ſelf. And as we have demonſtrated in the *Corollaries* to the *twenty-ſixth Propoſition* of the *firſt Part* of a Diſcourſe concerning *Reſpiration*, that the Motion of the Blood may for ſome uncertain Space of Time be ſuppreſſed without the abſolute Death of an Animal, although ſeemingly ſo; and that an Animal may in ſuch a Caſe return to himſelf, and the Operations of Life, if within ſuch Space of Time the ſtagnant Humours of themſelves ferment, and keep in Motion: Where therefore a *Lentor* is broke, before it is ſo far degenerated from the Nature of Blood as to be utterly incapable of vital Motion, that Body, which was to Appearance dead, and a mere Carcaſe, will glow into a freſh Warmth, and renew its vital Actions.

Thirſt in the Mouth only. But if this *Lentor* accumulates in the Arteries, whence the Spittle and natural Moiſtures of the Mouth are ſecerned by their proper Glands, ſo that no ſuch Secretion of Moiſture can be made, there will not therefore be given any Afflux of Humours to thoſe Parts, whereupon they muſt grow dry, and from ſuch Dryneſs will proceed a Senſe of Thirſt: But all this while, if the reſt of the Body is not thus dryed from the ſame Cauſe, but moiſtened with its natural Humidities, or a *Lentor* that is more aqueous, there will not therefore be a Senſe of Dryneſs, and a univerſal Thirſt in the other Parts of the Body.

But if this *Lentor* is not ſo very obſtinate, its leſs viſcid Parts may be ſeparated in their ſlow Motion thro' the ſalival

Glands, but yet more viſcid than a natural Spittle, and which, when drained into the Mouth, will be clammy and adhæſive; and according to the different Natures of it, will it be differently coloured, but thoſe Diverſities cannot be reduced to any certain Standards. Hence the Tongue will be dry and rough, from a Dryneſs and Hardneſs of the *Papillæ* on its Surface, which in an Afflux of moiſt Spittle are ſoft and yielding; it will be black from the ſtagnant *Lentor*, or from the Tinge of bilious Vapours from the Stomach, which as they are in but ſmall Quantity, that is extended thin upon its Surface, they will ſtain it at firſt but weakly; but afterwards grow deeper, till it becomes quite black.

The Tongue rough, black, &c.

But becauſe the *Vertebra* are the moſt thick of all the Bones, and leſs moved than any of 'em; and as the Ramifications of the capillary Arteries are diſperſed through all their *Sinus's*, and there is internally no lateral Compreſſure, and the leaſt imaginable againſt the larger Veſſels running into their Cavities, both by Reaſon of very little Action upon them from the Motions of the *Vertebræ* themſelves, and the inſignificant Motion of the Muſcles; therefore the *Lentor*, which is diſtributed into ſuch Veſſels, as have neither Compreſſion upon their Capillaries, nor larger Trunks, will with

The moſt intenſe Cold in the Back.

great Difficulty be puſhed forward, ſo as to paſs through the Arteries into the Veins: Wherefore if it be very tenacious, and ſtrongly adhering to the Membranes, it will occaſion a Perception of Cold in the Back, not only after ſuch Perception ceaſes all over the Body beſides, but even after the reſt of the Body is grown conſiderably hot; and this Perception of Cold will remain there for ſome Days, according to the Quantity of Compreſſion ſuch a *Lentor* requires before it can get through into the Veins; or if it be incapable of ſuch Circulation, until it ferments of it ſelf, and thereby grows ſo fluid as to paſs into the Veins, or waſt by Perſpiration. But it is very manifeſt, that this Duration of Cold in the Back cannot be cauſed by the Blood contained in the *Cava*; for in the firſt Place it is apparent from the preceding *Propoſitions*, that according to the Order wherein the Cold comes on, it is firſt felt in thoſe Parts, where moſt Capillaries are diſperſed, and that in the larger Trunks the *Lentor* is confuſedly mixed with the more liquid Blood, from which the Heat is able to diſengage it ſelf, and exert it ſelf ſo much into Motion, as will deſtroy all Perception of Cold: Again, Secondly, as it is certain that upon the Ceſſation of Cold, the Blood alſo which is contained in the Trunks of the Canals is hot; if therefore the Cold which is perceived in the Back proceeds from the Blood in the Trunks of the Veſſels, when the ſame Blood grows hot the Cold would vaniſh, but that does not always happen. Nor does it come from the Veſſels diſperſed through the ſpinal Marrow; for they are diſtributed through that as through the Brain, that is, they interſect one another Abundance of Times, and by that Means break the Blood into a State of ſufficient Fluidity; add to this, that ſo intenſe a Cold, that is commonly protracted for many Days together, would chill and thicken the nervous Fluid, or would at leaſt retard the Influx of Blood into the medullary Glands, (that is, by the *Lentor* obſtructing the Veſſels) from whence there would be ſome Defect in thoſe Parts that are ſupplied with Nerves from the ſpinal Marrow, as a Privation of Senſe, or Motion, or both, which we ſee does not happen; and therefore what was propoſed does appear to be true.

But in the Breaſt there does eaſily enſue a ſlower or a more frequent Pulſation of the Heart, according to the ſlower or quicker Paſſage of the *Lentor* in the Veſſels, after the Manner as was explained to happen in the Tremors of any of the Muſcles: But if this *Lentor* is ſo obſtructed, or in ſuch Manner adheres to the Arteries, that it requires a very long Time for its Protruſion through the Veſſels of the Heart; or if it preſſes againſt the Nerves adjoining to the Arteries, or inſinuates into their Cavities; or if the nervous Fluid it ſelf does not flow into the Nerves of the Heart, from a like Compreſſion upon their Origin in the Brain; or if it be thicker, and on that Account moves ſlower; or if from all or any of theſe Cauſes it comes about, that the Heart cannot alternately contract within its natural Spaces of Time, there muſt then be an intermitting Pulſe. Yet although the *Lentor* ſhould be ſo great and ſo univerſal all over the Body, that very little Blood flows back through the Veins, whereby its Flux is not continued, nor diſtends all the pulmonary Veſſels, therefore there will not always be in Readineſs a ſufficient Quantity of Blood in the Auricles of the Heart, at the Time of its Reſtitution, and conſequently will its Contraction be on another Account, than that which is made in the Arteries; whence Syncope's, Loſs of Strength, *&c.*

Palpitation of the Heart, and an intermitting Pulſe.

Syncope, &c.

Becauſe alſo the Blood is viſcid and cold, the Blood will therefore flow eaſily enough through the Lungs, until it hath acquired a certain Degree of Viſcidity,

dity, but when it goes beyond that Meaſure, it will then flow through them with more Difficulty, or ſtagnate; whereby there will be excited that troubleſome Senſation, which we cuſtomarily endeavour to throw off by ſtrong Reſpiration, and fetching the Breath deep, as in Sighing; and if by ſuch Means the burthenſome Humour is ſhook away from its Lodgment, and carried into the pulmonary Veins, the Lungs will then become eaſie, and no other Inconveniencies thence enſue; but if it yet adheres obſtinately, and cannot be removed, the Arteries will more and more be thruſt outwards by the affluent Blood, which Circumſtance, attended with an Increaſe of Heat alſo, will generate an Inflammation.

Sighing.

Inflammation.

If by too great a Quantity of *Lentor*, or Conſumption of Strength, or any other Cauſe before enumerated, ſufficient to occaſion Death it ſelf in the cold Fit, whoſoever doth ſo die, as it may often happen, will have upon the Superficies of their Lungs manifold Variegations, like to the Branchings of Trees, from a hard, livid, or black Blood; and the *Lentor* it ſelf, which at ſuch a Time is paſſing through the Lungs, may, by becoming more viſcid and compact, ſo obſtinately adhere to the Veſſels, as to

Variegation on the Lungs of thoſe who die in the cold Fit.

to ſtop entirely the Blood's Motion, and bring on Death.

But as there are many *Viſcera* in the Abdomen, wherein Humours are ſecerned from the Blood, during the cold Fits Continuance, every ſuch Humour will be ſeparated more viſcid than natural, and ſuch as partakes of the original *Lentor* it ſelf. Therefore in the Liver, either the Slowneſs of the Blood's Motion, in Conjunction with a *Lentor*, is ſuch as will admit of a Separation of Bile, but ſuch a one as is thicker than natural, becauſe it comes from a Blood ſo circumſtanced it ſelf; or if ſuch Retardation, in Conjunction with a *Lentor*, is leſs than is required for its Separation with its natural Viſcidities from the ſame Blood, and its Derivation into the biliary Ducts, then only the moſt thin Parts of the Bile will be ſeparated, and a Cholor produced that is fluxile; and both theſe will have their Diſorders, and be of different Efficacies: The thinner Parts, which will be, as it were, the Spirit of the Bile, will operate according to its peculiar Activity and *Impetus*; and the thicker Part, in Proportion to the Quantity of its conſtituent Particles, which in ſo ſmall a Bulk will be very great.

The Bile thicker or thinner than natural.

The like Conditions of Secretion will happen to the Humours ſeparated in any

And the like of other Humours.

any other Part of the Abdomen; and ſo in both thoſe Reſpects that Juice which is ſeparated in the Glands of the Inteſtines will be vitiated; the like to that in the Spleen, of whatſoever Kind that Humour is; and ſo of all other Humours whatſoever that are ſeparated in any of the abdominal Glands.

The Urine thin, crude, &c.

Becauſe the Urine is a Fluid, conſiſting of earthy and ſaline Parts floating in a Lymph; and of which the former are more difficult to Motion in Proportion to their Dryneſs, and the latter more eaſie, but capable of being coagulated by Cold, and of Mixture with any Viſcidities and *Lentors*, the earthy Particles will find a greater Difficulty to be diſengaged from thoſe viſcid Implications of *Lentor*, which on all Sides ſurrounds them, in ſuch a State of Blood as that of the cold Fit; and the more ſo, becauſe during that Space the compreſſive Force is leaſt: But whether the Blood be ſuppoſed to flow through the Kidneys freely, or if it does not flow ſo free as naturally, yet it will be able to implicate theſe hard, and leſs moveable Particles, which will therefore affect the Urine, ſo that what is made during this will be crude, becauſe the moſt aqueous and liquid Parts will flow through the Glands, and leave theſe rigid ones behind in the Viſcidities, that will not be able to paſs; which likewiſe will diminiſh the Quantity let through, and cauſe the Urine alſo to be at this Time made but ſparingly.

Heart-Burn, Hiccup, Nauſeouſneſs, &c.

Further, when the Juice of the Stomach is ſeparated in an unnatural State, in its Paſſage through the ſecretory Glands into its Cavity, it will give a Senſation different from what is natural; nor will this be ſuch as a Senſe of Hunger, unleſs this diſtempered Juice be ſo conditioned as to excite Hunger, after the ſame Manner as it is produced, when all things are well in the Stomach; and therefore as this Juice alone is viſcid, ſharp, corroding, or penetrating, will there be a feeling of ſomething in the Stomach like Conſtriction, or rubbing, or of Eroſion and Pungency, *&c.* whence Pain, Heart-burn, Hiccup, *&c.* But all theſe Symptoms are producible from Bile only; for if that is viſcid enough to adhere to the Coats of the Inteſtines near its emiſſary Duct, ſo ſtrongly that the Contractions of the Inteſtines cannot ſeparate it, it will continually collect in the *Duodenum*, until by its Quantity it regurgitates into the Stomach, where it will produce thoſe enumerated Complaints; and the ſame Regurgitation may happen from a leſs viſcid Bile, where the Inteſtines are greatly contracted, as it happens from extreme Cold, or Convulſions; when therefore the Bile is got into the Stomach, its more thin Parts, as it were, filter up the Sides of the OEſophagus, communicate a Bitterneſs to the Palate and Tongue, and ſtain it with Diſcolourations. In this diſtemper'd State therefore of the Stomach, whether from a Derivation of its own Juice in an unnatural Condition, or of Bile, or both, there will follow not only an Inappetency to Food, but a Loathing againſt it, or an Averſion to it; for there is ſomewhat already in it that engages its Perception with Uneaſineſs, and which is endeavoured not to be got rid of by taking in Food, but by Hiccup, Vomiting, and ſuch like convulſive Motions, or by abſtaining at leaſt from taking in any thing at all, which can have any Manner of Efficacy upon it; and whatſoever kinds of Food are at ſuch times taken in, they occaſion great Diſorders, and Nauſeouſneſs, inſomuch that if ſuch diſtempered Juices are collected in great Quantity, they will by every ſlight contractile Motion be thrown up by vomiting; or if they are ſo vellicating, although in a leſs Quantity, as to force the Membranes of the Stomach into ſtrong Contractions, the *Nauſea* will be changed into Vomitings of unmixed Bile, of ſome kind of Colour or other, as it hath been accumulated in the Stomach by it ſelf, or in Mixture with other Humours, which have been alſo derived into it.

A Flux of the Belly.

But if any Humour whatſoever, whether of the Stomach, Pancreas, Liver, or Inteſtine, ſhould be drained into the Inteſtines, in a greater or leſſer Quantity, and find them not too much conſtringed, in caſe it is not ſo viſcid as to adhere to their Coats, it will flow through them in a natural Manner, and produce a Flux of the Belly; and even if the Inteſtines are too much conſtringed, when the Quantity of ſuch Humour is great enough to overcome the conſtrictile Force, it will notwithſtanding make its Vent through, ſome Way or other: And if it be neareſt to the Stomach, it will get into that, and come up by Vomit; but if the whole Length of the Inteſtines is to be conquered, and a greater Reſiſtance to be broke through, it will happen to be a *Diarrhæa.* But ſuppoſing the Bowels are in this Manner conſtringed, and the Quantity of offending Humour be but ſmall, ſo that it hath not *Moment* enough to force open to it ſelf a Paſſage through them, yet if by its Accrimony, or Fluidity, it is either endewed with a natural Efficacy, or a Derivative one from Compreſſure, or both, ſufficient to dilate the inteſtinal Conveyances, there will then happen a Flux, after the ſame Manner and from the ſame Neceſſity, as any other Flux can happen, of what kind ſoever, as is in it ſelf manifeſt.

Uncertain Tremors in divers Parts.

Again, ſuppoſing a *Lentor* not yet ſo tenacious, to be accumulated upon any Part naturally debilitated, or made ſo by ſome Diſorder or Cuſtom, ſo that the *Lentor* cannot, by the utmoſt Compreſſure poſſible be forced away out of the Arteries, and carried into the Veins; its moſt thin Parts in this Circumſtance will be ſqueezed out, or more intimately compacted with the other; wherefore on both Accounts there will enſue a Hardneſs, which if it cannot be conquered by the affluent Blood, even in its hotteſt State, will by ſuch continual Afflux accumulate into a Tumour; and that either by a waſte of its moſt liquid Parts, or a more compact Conſiſtence, will degenerate into a *Schirrus*, in one or another Part, without any certain Rule, unleſs it can arrive to ſuch a Degree of Heat, as to ferment; in which Caſe too it will not ſoon be carried away, but cauſe an Inflammation; and ſo of any other Humours.

But

A partial Paralyſis.

But if this ſame *Lentor*, which is the Foundation of Tumours, ſhould ſo accumulate upon the Nerves, muſcular Fibres, or Arteries, as to obſtruct the Paſſages for the nervous Fluid, or Blood, or both, into their proper Canals, or ſo to preſs upon the Fibres, as to cloſe them up, or fill them with Viſcidity, there will happen a Palſie of that Muſcle where its Nerves, or Arteries, or both, are thus affected, in Caſe ſuch Accumulation cannot in Time be broke away; and in Caſe it can be wore away, yet during its Continuation, that Part will be Paralytick. In this Circumſtance, if a Nerve be ſo affected, that its proper Fluid cannot undulate through it as naturally, there will be a Palſie with a Deprivation of Senſe; as it is manifeſt from the known Laws of Senſation, muſt ariſe from Compreſſion only.

Spots.

Further, in Caſe this *Lentor* happens to ferment in any Part of the Body, and by that Means becomes more fluid, inſomuch that by a continued Compreſſure it can eſcape the Veſſels as far as the Surface of the whole, or the Superficies of the *Viſcera*, or can breath quite through by Sweat; or if ſome Parts of this *Lentor* can in like Manner break through without Fermentation, ſo that being arrived at the ſuperficial

Membranes, either between the Skin and Cuticle, or between the fine Coats of the Cuticle it ſelf, it there becomes of ſuch a Nature, that without the Help of any Fermentation there alſo its moſt thin and liquid Parts can perſpire, leaving the more hard and leſs moveable behind; and if the Parts thus eſcaping be ſo ſmall in Quantity, that they cannot raiſe a Tumour, but yet are capable of tinging the Parts where they lodge with a Colour, then Spots will be generated, either on the Surface of the Body, or upon the *Viſcera*; the like to which would alſo happen if the Matter thus eſcaping, and diſtilling into the Interſtices of the Membranes, had not mixed with it any thin or liquid Parts, but conſiſted only of ſuch as are hard and fixed. But if this Matter, when thus circumſtanced, is capable of Fermentation, and Confinement at the ſame Time within the Interſtices where it lodges without Perſpiration, ſo that it requires more Space when it ſo ferments, it will then lift up the Part into a Tumour, or a Puſtule, differently coloured, as the generating Matter was diſpoſed in it ſelf to this or that Colour, when it came originally into thoſe Interſtices, or whether it obtains them by its Fermentation. Yet theſe Puſtules might be produced without any further

Fermentation, if the Matter thus inſinuating into the Interſtices of the Membranes be continually accumulated in Quantity, ſo that by its Increaſe only it requires more Room for its Reception and Lodgment.

Cold Sweat. Laſtly, If this *Lentor* be of ſuch a Nature, that by a farther Compreſſure from the affluent Blood, or by any Solution which it endeavours to obtain in ſuch a State of Compreſſure, its Parts become ſo diſpoſed as to ouze through a Kind of *Ichor*, that is, a moſt thin Humour, through the Glands of the Skin, after the Manner of Sweat, or through the Pores like Perſpiration, without any glandular Secretion, and this in Conſiſtence and Tranſparency like to Sweat, the Part through whoſe Pores ſuch Humour eſcapes will be ſaid to ſweat; and where this *Lentor* happens univerſally to the whole Body, which is likewiſe poſſible, the whole Body then will be in a cold Sweat, even in the Time of the cold Fit. But this will the more eaſily happen to be the Caſe, where the Conſtitution is very ſcorbutick, or over-run with cutaneous Foulneſſes, or any other Diſeaſe of that Kind that is attended with a Salt Diſpoſition of Blood; for Salt is more efficacious in fuſing the Humours the ſame

Time that it gives a Perception of Cold with greater Intenſeneſs.

A Privation of Nouriſhment, without a Senſe of Hunger.

It is likewiſe manifeſt, that when the Conſtitution is thus clogged with a *Lentor*, and the Blood affected, as above explained, a natural Nouriſhment will not at the ſame Time ſubſiſt in the Veſſels, nor can it be again repaired in theſe Diſorders, whereupon muſt of Neceſſity enſue a Privation of Nouriſhment; but it does not therefore follow that there will ariſe a Senſe of Hunger, although Nouriſhment is not only wanting, but alſo ſomewhat is continually, through this whole State of Diſtemperature, waſting from the Body, which otherwiſe would not be conſumed, and which if conſumed in a natural State, would be followed by a Senſe of Hunger; for as by the Strength of the Diſeaſe only, we know the Debility of the Conſtitution, this Debility, which would otherwiſe be the Conſequences of Hunger, is not placed to the Account of a Want in Nouriſhment, but to the Violence of the Diſeaſe; for in this Circumſtance there is wanting that gnawing Senſation at Stomach, which we by Experience learn to be the Attendant of true Hunger, wherefore we are certain the one is not given, where the other is not alſo given. In the Condition therefore as here put, the Body is after a certain Manner exhauſted, and it is alſo attended with a Debility, which ought to be the Effect only of ſuch Exhauſtion, although it might be ſuppoſed that from theſe ſhould ariſe exactly the ſame Senſation as that which happens through the whole Body in a natural State; but becauſe this is not joined with that Senſe at Stomach, which by Experience we know to be the Conſtituent of true Hunger, there muſt be a Privation of Nouriſhment through the whole Body, without ſuch a Senſe of Hunger. Nor does it ſeem reaſonable to be admitted, that the Senſation which ariſes from Exhauſtion in a cold Fit, ſhould be in every Reſpect the ſame as that which proceeds from natural Hunger; becauſe as the Conditions both of the Juices and Solids are in theſe Circumſtances widely different, it is not poſſible that the ſame Senſations ſhould reſult from both: And thus much may ſuffice for what happens to the Patient during the cold Fit.

The Concomitants *of Heat.*
A Delirium.

In the hot Fit does eaſily come on a *Delirium*, either from too much Dryneſs, or too much Heat; and intenſe Heat will dry away the proper Moiſtures, ſo that the whole Maſs of Blood will be rendred dryer, whether the *Lentor* producing this Effect had in its Compoſition any Humidity, or not; in this State then all the remaining Humidities are waſted, and the Nerves dryed ſo much, that they cannot obey the Motions of any ſenſible Species, nor undulate in Conformity to their Impreſſions, without the Influence of ſome Power greater than is given by the Motions of ſome Species; therefore the Nerves will fall into Tremors, by yielding to ſome Impreſſions, and not to others, in ſuch uncertain Order and Meaſure, that Images will be falſly repreſented to the *Senſorium*, and a *Delirium* produced. But if this higheſt Degree of Dryneſs does not happen; yet by Means of the Heat the Spirits will be too much diſſipated, and undulate the Nerves irregularly; that is, they will excite this or that Species without any Order or Connexion, and produce a confuſed Repreſentation of Images, which is a *Delirium*.

Watching. On both theſe Accounts will be produced very obſtinate and continual Watchings; for that Dryneſs of the Blood which is produced by too much Heat, and maintained by the ſame Cauſe, will allow no Humidity to be ſupplied to the Nerves and other ſolid Parts, whereby to moiſten them, and render them fit for Motion; nor will it allow any Moiſture to be ſupplied to the Spirits, whence they become more rigid and active, that is, they more violently agitate the Muſcles and Fibres than is conſiſtent with that Compoſure as is requiſite to ſleep.

But in this hot Condition there may be given ſuch Requiſites as will put on the Reſemblance of Sleep, that is, as will keep the Patient without Senſe and Motion; and this will happen if the Heat is accompanied with a *Lentor*, as often as ſuch *Lentor* ſhall obſtruct the Capillaries in the Brain, in ſuch Manner that the Blood cannot reach to thoſe Glands which are deſtined for the Secretion of Spirits; or if thereby the Arteries are ſo crowded and preſſed externally, that although the Blood can flow through them, yet the Brain is ſo compreſſed by ſuch an Extenſion, that both the Generation of Spirits, and their Motion into the Nerves, cannot be accompliſhed. And ſuppoſe the Heat ſhould abound in the Head without any *Lentor* there accumulated, when the Heat hath arrived to ſuch a Degree, as will attenuate the Blood enough to tranſpire from it whatſoever is ſuited for the Excitation of Senſe and Motion, whether ſuch Tranſpiration be inſenſibly without any Effort of Nature, or whether ſuch Parts perſpire after the Excitation of muſcular Motion, and undulations in the Nerves, the Body will afterward be left altogether inactive, and without Senſe, ſo as in Appearance to be in quiet Sleep: For both the Pulſe and Reſpiration will be entirely compoſed by Means of a weakned Energy of Spirits, reduced alſo to be ſmall in Quantity; and the Patient for the ſame Reaſon will be without Reſtleſneſs or Perturbations, or any Kinds of a *Delirium.* But there may be occaſioned ſometimes Concuſſions or Startings between whiles; that is, where, by a diminiſhed Quantity of Spirits, that Reſiſtance from the Conſtricture of the Nerves cannot be overcome, ſo that a long Time is to be expected before they can fill the muſcular Fibres; and when they are ſharp and precipitate in their Effuſion, they will ſuddenly and ſtrongly contract the Muſcles; which Extremes happening in theſe or thoſe Nerves without Regularity, this ſudden and violent Contraction will happen in theſe or thoſe Muſcles without any certain Meaſure, whence conſequently muſt proceed Concuſſions and Tremors upon the Parts, or of the whole Body.

A Stupor of the Body.

Suppoſe alſo by this Exceſs of Heat, the Spirits, or the Matter from whence they are generated, to be ſo far conſumed, that they are not ſufficient to aſſiſt in the Operations of the Mind, the

Mind will be ſtupified; but if there be ſo much in Quantity as to ſuffice for the Repletion of the ſenſatory Nerves, and to excite a gentle Undulation to the Brain upon the Impreſſions of external Objects, the external Senſation will go on regularly. But if there be a Quantity of Spirits ſufficient for the Operations of the Mind, but a Heat at the ſame Time that waſts them too much in the ſmall Fibres, ſuch as are all the Nerves conveying back Impreſſions to the Brain, or occaſions a continual Perſpiration of them, then there will be a right Diſpoſition of Mind, with a Diſtemperature of external Senſation.

A Palſie. By this Dryneſs and Perſpiration of Spirits, any partial or general *Paralyſis* may be occaſioned, either perfect or imperfect; and firſt of all when a Nerve, or an Artery, or both, communicating Senſe or Motion, or both, to any Muſcle, is dried or rendred criſp, or when the Spirits are exhaled before they enter into the muſcular Fibres, and ſuch a Part will remain in Inactivity as long as theſe Inſtruments are ſo diſordered; but an univerſal Palſie follows when this happens to the whole nervous Syſtem.

Pains of the Head. A pungent Pain in the Head will enſue from a Solution of the Blood by its Heat into ſuch Parts as are very active and penetrating; a throbbing Pain, becauſe the Blood, greatly rarified by Heat, takes up more Room in the Arteries, and thruſts them with a greater *Impetus* outwards, whence their Membranes or Coats are violently diſtracted, and a Pain with Throbbing; which alſo will be accompanied with Tenſion, from the ſame diſtractile Force; and if to theſe be joined an Accumulation of *Lentor*, there will be a Weight too felt in the Head at the ſame Time. But if there is not given a Plenty of Spirits keeping the Brain in its due Tenſion, by that Diſtraction of its Membranes and Fibres, ſo that they fill, and reach into Contact with one another, there will be a Perception of thoſe Affections, as we feel in thoſe Parts which are hollow or empty, and we ſhall ſeem to have a Lightneſs or Emptineſs in the Head.

Phrenſie. From the ſame Exceſs of Heat eaſily proceeds a Phrenſie; for as the Blood rarifies by ſuch Heat, therefore it is forced to make ſome Stop in the Straitneſſes of the capillary Arteries, and ſome Parts of it ſtay behind, while others which are more ſubtle get through, whence a greater Quantity of that which is leſs fluxile will there accumulate, and diſtend the Arteries beyond their natural Dimenſions, while the Parts which are leſs fluxile, by Means of their included Heat, will produce Inflammations; which will alſo the more readily happen, if ſuch Heat is accompanied with a *Lentor*, as before explained.

Hemorrhages. From this very Rarifaction of Blood, may happen an Hemorrhage in any Part; for when it accumulates in the capillary Arteries of any Part, and exerts a greater *Niſus* than natural againſt either of thoſe, or the next Ramifications, it will make its Impreſſions moſt upon the weakeſt Parts, ſo that the Blood will break through, that is, there will be an Hemorrhage.

Thirſt and Dryneſs. But as this Heat attenuates and evaporates the aqueous Humidity, ſo that the Blood is deprived of that Matter, which ſhould go into Spittle, and moiſten all the Parts of the Body; whence will ariſe Thirſt about the Mouth, and a Dryneſs all over the Body, with a burning Heat from the Fever; and which Heat will be moſt intenſe in the Parts moſt dryed by the Fever: But if the Heat does not wholly waſt the Humidities, there will be a Spittle generated in the ſalival Glands more viſcid than natural, which in ſuch a Circumſtance being derived into the Mouth, will hang about it ſomewhat like a Liquid, and be differently coloured, in Proportion to the Share of Humidity retained in it, and the Activity of the Heat modifying various Appearances, all different from what is natural. But becauſe upon the Superficies of the Tongue does ariſe many *Papillæ*, ſeparating a *Mucus* that covers it, the igneous and dry Particles which exhale from the *OEſophagus*, or *Aſpera Arteria*, or through their own Ducts, with all the Steams from the Breaſt and *Abdomen* coming up that Way, will be entangled therein; which cannot but occaſion the Surface of the Tongue to be extremely dry, inſomuch as greatly to contract the Fibres conſtituting its exterior Coats; and ſince the contained Parts of the Tongue will not give Way, in Proportion to ſuch violent Contraction of the Surface, it muſt neceſſarily happen that the exterior Membranes muſt be divided this and that Way, ſo as to leave great Fiſſures and Chops between them; and differently coloured alſo, for the Reaſons above: And further, from this very Cauſe of Heat and Dryneſs, a Perſon may loſe the Faculty of his Speech, without loſing his Underſtanding, or Perception of external Objects; that is, he is under a Diſability to contract and exerciſe thoſe Parts, through their Exceſs of Dryneſs, which

Clammineſs in the Mouth,

and Loſs of Speech.

are requiſite for the Articulation of the Voice.

What Perception in the Back.

There is nothing happens remarkable in the Spine from ſuch a hot Fit as comes on of it ſelf without any foregoing Cold; but when a hot Fit comes after a cold one, it may retain along with it the perſevering Cauſe of Cold, in the Manner above explained; and in Conjunction with this Cold we are accuſtomed to complain of a Pain in the Loins, as if they were actually dividing, and it is out of our Power even to ſuſtain or ſupport our ſelves: The whole Property of this *Lentor*, when it obſtructs the Veſſels in the Interſtices of the Bones being ſuch, as will have the ſame Effects, and produce the ſame Senſe of Pain, as have been explained in the preceding *Propoſitions*, and which the *Greeks* call ὀϛοχόπον, ariſing from no other Cauſe than a Preſſure of the *Lentor*, bearing againſt the Sides of the Bones with an unuſual *Momentum*, or thruſting againſt them, in a Manner that is very unnatural.

An intermitting Pulſe.

An intermitting Pulſe will follow from an Intermiſſion in the Motion of the Heart, and the Heat will intermit in its Motion from the ſame Cauſes, and after the ſame Manner as we have juſt now demonſtrated a Palſie to proceed from Exceſs of Heat;

to which may be here added, that this may alſo happen from a Poverty of Spirits, when they are exhaled by too much Heat, ſo as not to fill the nervous Cells in due Space of time, but require a much longer for their Accumulation in Quantity ſufficient for the natural Functions: The ſame may be ſaid concerning the Blood exceeding in the like Properties, and cauſing too much Contraction. The reſt of thoſe Affections, which we have obſerved to happen from Cold, may likewiſe here enſue, as will eaſily appear to any one who attends to what hath been taken notice of already to proceed from Heat; to which alſo may be added a Cough, from ſharp Particles put into Solution, and ſtimulating the Breaſts, or from an Inflammation having the ſame Effect.

The Bile ſeparated thinner and ſharper.

But becauſe from the Heat of the Blood, its Motion both through the Arteries and Veins is made quicker; thoſe Juices therefore which are moſt viſcid, and on that Account require a ſlower Velocity of Blood for their lateral Seceſſion into their Secretory Glands, will admit only of their moſt thin Parts to be ſecerned, that is, ſuch only as can ſecern in ſuch a Velocity, and recede into their lateral Ducts: Wherefore in the

Liver, wherein Bile, the moſt viſcid Juice is ſeparated, what of that Juice in this Circumſtance is ſecerned will be more fluxile, and compoſed of its moſt moveable Parts; that is, it will be thinner and ſharper, but it cannot be determined what Quantity of this thinner and ſharper Bile ſhall be ſeparated; for by Means of an augmented Velocity of Blood, a greater Quantity of it will flow through the Liver in any given Space of Time, than flows thro' the ſame *Viſcus* in the ſame Space of Time with a natural Velocity; from whence it may happen for a greater Quantity of Bile to ſeparate from an augmented Quantity of Blood; but becauſe the Velocity may be an Obſtruction to this Secretion, it may be ſo circumſtanced as to make it more or leſs, as ſuch Velocity is accompanied with a Diſpoſition of Blood, that will with more Eaſe or Difficulty part with its Bile; and how far, or to what Meaſure of Conſiſtence in the Blood this Heat is able to bring it, cannot with any Certainty be determined. The ſame is likewiſe applicable to all the other moſt viſcid Humours which are ſeparated in the *Viſcera* or Glands of the *Abdomen*, or throughout the whole Body.

The Urine of various Kinds.

But, on the contrary, as the Urine conſiſts for the moſt Part of Water, that is to ſay, of ſomewhat very fluid, but what alſo requires its proper Time for Secretion and Derivation; by an increaſed Velocity of Blood therefore the Separation even of that may be leſſened, and much more conſequently will the Separation of more groſs Parts be retarded by the ſame Means, which of themſelves, without the Help of an aqueous Vehicle, can never ſecern; and of this Vehicle they may be deprived, not only by Reaſon of an augmented Velocity, but alſo becauſe, where the Heat is very intenſe, ſuch aqueous Parts are by it attenuated and exhaled; whence there is no Urine; but if the Heat is ſomewhat more remiſs, and the Velocity alſo not ſo great, whereby there is given ſome Time for the Seceſſion of aqueous Particles, the Urine then will be made ſmall in Quantity, and crude. But if the Velocity be further diminiſhed, ſo far as to admit along with it more rigid Particles through the ſecretory Paſſages, the Urine will then become higher coloured; but becauſe ſome Part of the aqueous Humidity will be exhaled by the Heat, a leſſer Quantity of aqueous Parts will be found in it; and further, becauſe ſuch Heat cannot attenuate or exhale the rigid and groſs Particles,

ticles, theſe will yet be diſſolved in a retarded Velocity, and be incorporated with ſuch a diminiſhed Quantity of Lymph, ſo as to conſtitute a Urine that will not be crude, but higher or lower coloured, as the Quantity of Lymph is proportioned to the Quantity of rigid Particles; and the whole will be but ſmall, as appears from the Doctrine of Urines: And all the other Affections which we have explained to happen in the *Abdomen* from Cold, will alſo be the Effects of Heat, as is manifeſt from what hath been already ſaid.

The ſame Affections as from Cold in every other Part of the Body, but uncertainly.

The ſame Affections will happen in every other Part of the Body as from Cold, but with great Uncertainty, as the Principles of Tumours, and Tumours themſelves, and eſpecially inflammatory ones, as hath been already demonſtrated; as alſo Spots, Puſtules, *&c.* even when the Heat ſucceeds Cold without a *Lentor*; nay, the ſame happens to the whole Conſtitution, not excepting even cold Sweats, when a *Lentor* with Heat is ſuppoſed to preſs through the ſudoriffick Glands, whatſoever hath been ſeparated by ſuch Heat, which will paſs them ſeparately, and affect the Skin with a Senſe of Cold and Clammineſs. But many of the foregoing Symptoms will by ſo much the more be aggravated and fatal, when they proceed from an Heat that hath no preceding Cold, but coming on firſt of all by it ſelf; becauſe it then ſuppoſes a great Tenacity in the *Lentor*, and its firm Adhæſion to the Veſſels.

What hath hitherto been remarked, we here judge ſufficient; for the two Sources whence we have deduced all theſe diſtempered Affections, are very extenſive; and whoſoever diligently attends to this *Propoſition*, and compares it with what we have wrote concerning *particular Diſeaſes*, will find that there is no Diſtemperature which may not be attributed to one or other of theſe two Origins. And thus far we would aſſume from this whole *Propoſition*, that from it are ſuppoſed to be known, all that is commonly included under the Symptoms of Fevers; and that by this it appears that all the moſt fatal of thoſe Symptoms, which Phyſicians ordinarily aſcribe to *malignant*, *peſtilential*, *occult* Qualities, and the like, do ariſe only from more obvious Cauſes, and have in them nothing *malignant* or *occult*; but act only by more or leſs fuſing the Blood, and coagulating it into *Lentors*: which was to be demonſtrated.

PROPOSITION XXII.

The Antecedents *to a continued Periodick Quotidian, may vitiate the Blood in its Motion, Quantity, or Quality: But its* Concomitants *and* Conſequences *do not neceſſarily depend but upon its vitiated Qualities.*

Antecedents, *how they operate.*

Age, and a moiſt Conſtitution of Body, Climate, or Seaſon, do diſpoſe to, and produce cold Humours, as is in it ſelf manifeſt; Suppoſe therefore theſe to be natural, they will then have no other Effect than to vitiate the Blood in Quantity, by an Increaſe of Phlegm or Viſcidity; but from ſuch Sort of Humours likewiſe ariſe Liſtleſneſs to Action, and a leſs Quantity of Spirits than natural, whereby alſo the Motion of the Blood will be vitiated: Yet becauſe it cannot happen, that cold Humours ſhould abound beyond the Meaſures of Nature, and the Blood at the ſame Time preſerve it ſelf as to its Qualities in a natural State, (ſince under the Appellation of Blood we underſtand that Fluid which is compounded of all the Humours which flow through the Veins and Arteries, and for the Preſervation of which in a natural State there is required a determinate Meaſure of each) when therefore cold Humours are augmented in Quantity, the whole Compoſition, of which they are a Part, will, in Proportion to ſuch Augmentation, become colder.

Becauſe alſo by a plentiful Uſe of Milk, as in Sucking Children, a Chyle is generated more groſs and cold; and for the ſame Reaſon alſo where Teeth are wanting, in the Uſe of ſomewhat more ſubſtantial Food, as in young Children, whereby a ſufficient Comminution of it is not made in the Mouth, ſo as to diſpoſe it the better for Digeſtion in the Stomach, a Chyle is produced leſs concocted, or more crude, or cold; and on the ſame Account alſo is there the like Generation of a cold viſcid Chyle in old Perſons, who have loſt their Teeth; and much the more ſo too in the latter, becauſe ſuch are ſupplied with Juices leſs active, and leſs ſuited for Solution, and their Membranes are leſs contractile through Dryneſs: Theſe likewiſe can in like Manner vitiate the Blood in its Motion, Quantity, or Quality.

Perſons likewiſe of a corpulent, and groſs Habit of Body, will abound with Phlegm from the Diminution of Perſpiration, by Means of too much Fat, or a hard Skin; the like happens to Perſons of unactive Lives, in whom the Juices are not enough broke and diſcharged for Want of Exerciſe; to Perſons given to Intemperance, becauſe they take in more than they can digeſt; and to too much Sleep, becauſe that of all is the greateſt State of Inactivity, and occaſions too great an Accumulation of Humidity: And therefore the firſt Part is manifeſt.

How the Concomitants.

Becauſe then a Blood made of ſuch Humours muſt in it ſelf be cold, therefore likewiſe it will be thick and viſcid, or there will be generated in it a *Lentor*; but becauſe this *Lentor* is from watery or phlegmy Humours, it will therefore be accompanied with ſomewhat that is eaſie to be moved and ſeparated from its other Parts, and what will alſo eaſily admit the Diſengagement of any igneous Particles that lodge therein. When ſuch a *Lentor* as this then is brought into the capillary Arteries, it will adhere indeed to their interior Superficies, but its moſt liquid Parts with the Heat will be preſſed out, and leave behind it what is moſt tenacious, and dry, and what will moſt ſtrongly adhere to the Arteries; and as this moſt thin Part returns by the Veins, either alone, or in Conjunction with another *Lentor* of the like Kind, there will be a Return made in ſo much Time as is required to finiſh its Circuit through the refluent Veins; either by it ſelf, or in Conjunction with a freſh generated *Lentor*, or one derived from any other Part; but as the returning *Lentor* is in this Caſe ſuppoſed to be more fluxile than another, and but of an aqueous Conſiſtence, it will finiſh its Return in a ſhort Time, that is, in the Space of 24 Hours; and its Acceſſion will be without any Senſe of Cold, Rigor, or Shaking, with a continued Heat from one Fit to another, which will happen every Day, as appears from the preceding *Propoſitions*.

Why its Acceſſion in the Evening.

The Time of its firſt Attack will be chiefly when the Blood is moſt diſpoſed to Viſcidity, that is, on a Change from a warm into a cool Air, when the Skin is conſtringed, and Evaporation ſuppreſſed, that is, about the Evening, whence its firſt Acceſſion will be about that Time; and as the ſucceeding Paroxyſms anſwer the firſt regularly every Day, the future Acceſſions will alſo be about the ſame Time: But theſe may alſo happen without the Return of the ſame peccant Fluid, where there is in Readineſs ſuch an Humour in the Blood as is diſpoſed to paſs into a *Lentor*, upon ſuch a Conſtriction of the Skin as happens in the Evening.

Termination without Sweat.

But becauſe this more fluid Part, which is expreſſed from the adhering *Lentor*, recurs, there will be nothing left which can be ſeparated from the peccant Matter, whence there will be no Sweat in the Termination, becauſe the Humours are reduced very near to their natural Meaſures; but neither would there be Sweat, were the peccant Matter not thus to be reduced, if it be ſo attenuated by Heat, as to be rendred perſpirable; but neither will the Patient ſweat, although the peccant Matter is not attenuated enough for Evaporation, or returns not ſo viſcid as before; that is, if it be ſo far broke as to be ſeparable by the cutaneous Glands, but is hindred from it by ſome Impediment to its Derivation, into thoſe Ducts upon the Superficies; and this Impediment may be the *Lentor* it ſelf, which remains in the capillary Arteries, and covers the Surface, through which Sweat ſhould paſs, as it were with a Cruſt, ſo much that the Pores, which otherwiſe would let out Sweat, are rendred impervious. And what is here ſaid of the Glands of the Skin, may alſo be pronounced concerning the Glands in all other Parts.

Differences of Pulſes.

Why the Pulſe is rare, ſlow, unequal, and leſs than in other *Intermittents*, and the above enumerated Fevers, abundantly appears from the foregoing *Propoſitions*; for the Thickneſs of the Blood joined with Cold, occaſions a more ſparing Secretion of Spirits into the Nerves, and a leſs Force and Energy of Motion in the Blood through the Arteries.

How the Urine.

But becauſe there is a greater *Momentum* required for the Secretion of groſs Particles, and upon the Acceſſion of a Fit there is the leaſt Velocity of Blood, therefore thoſe groſs Particles which ought to be ſecerned with the Urine, cannot go off that Way at the Fit's Acceſſion, but only the more watery Parts, that is, ſuch as are ſecerned with a much leſſer *Niſus*, whence at this Time the Urine will be crude; but upon the Riſe of the Fever, the Blood's *Impetus* will be increaſed, or its Preſſure, whence the harder or thicker Parts will be ſecerned, and the Urine will obtain a Conſiſtence and Colour; and the rather, becauſe by the feveriſh Heat the more humid Parts will be attenuated and exhaled: And becauſe in this Kind of Fever a watery Humidity does more abound than in any other, it thence happens, that when the Urine is moſt heightned in Colour, yet it is leſs fiery and red than in other Fevers, where ſuch aqueous Humidity is in leſs Quantity.

Thirſt, &c. Again, becauſe by the Heat in the Fever ſome Portion of Humidity is waſted, and ſome Parts of the ſalival Ducts opening into the Mouth are furred by the *Lentor* in the capillary Arteries, therefore a leſs Quantity of ſuch Moiſture will be ſupplied to thoſe Parts from thoſe Ducts, whereupon they muſt grow dry, and be affected with a Senſe of Thirſt; but becauſe the Quantity of Moiſture in this Kind of Fever is greater than in any other, the Thirſt alſo will be more remiſs in this Fever than in others; unleſs with ſuch Humidity be joined a Salt, which ſhall imbibe all its watery Parts, and grow dry upon the Membranes, for in ſuch a Circumſtance the Thirſt may be greater than in any other Fever. By an Accumulation of theſe watery Moiſtures, which are as it were tranſparent, tinged with no Colour, and diſpoſing the Membranes to Flaccidity, the Complexion will ſeem bloated, flabby, and wan: A Drowſineſs will alſo come from the ſame Cauſe, becauſe that is moſt encouraged by Moiſture, and its Diſpoſition to ſoak into the Interſtices of any Parts. Inappetency in like Manner is a *Concomitant* of this Diſtemperature, not from the watery Humours, as they are ſuch, but from that Affection of the Stomach, and the whole Habit, which we perceive to be vaſtly different from what it is, when there is a craving, and a Neceſſity for Food, as hath been already explained in the preceding *Propoſition.* Hence likewiſe phlegmy Stools from the Abundance of ſuch Matter, whoſe thinner Parts, and thoſe moſt capable of Separation in the Glands of the Inteſtines, will, by the Intermediation of thoſe Glands, be brought into their Cavities, and detached away by Stool.

Whence its long Duration.

Becauſe from this *Lentor* is ſeparated what is moſt fluid, and that which remains is greatly tenacious; and becauſe in ſuch a very moiſt, watery Conſtitution, the natural Heat, as well as that of the Fever, is leſs vivid, and there is a feebler Contraction upon ſuch a *Lentor* for its Removal, or Diſlodgment; for all theſe Reaſons therefore that *Lentor* which ſticks to the Veſſels will with greater Difficulty be broke away, to be comminuted by Circulation; whereby the Diſtemper will be protracted into a long Space of Time: As alſo will the Fever be long protracted, when it is continued by the Influx of a like Kind of *Lentor* from ſome other Parts into the Blood-Veſſels; for from whenſoever it comes, whether it is generated either from too remiſs an Heat, or too ſlow a Motion in the Blood, ſuch a *Lentor* will with Difficulty be conquered, or its Cauſe removed. And Experience teaches us, that a *Quotidian* will ſometimes be protracted for 40, 60, or more Days.

Its Termination by Sweat. But the *Lentor* by this Time will give Way, and be ſo taken up by the perfluent Stream, that by its Motion in the Blood, and Agitation in the Lungs, it will be rendred altogether fluxile, and incapable of any further Adhæſion to, or Obſtruction of, the Arteries. If therefore in this State of Liquation the *Lentor* is changed into ſomewhat that is expreſſible by Sweat, the Fever will then terminate with Sweat; if into any Thing that is ſeparable by the Glands of the Inteſtines, Pancreas, Stomach, or Liver, there will then enſue a Looſneſs of the Belly; if by the ſalival Glands, there will ariſe Defluxions of Spittle, and eſpecially if it be of that Kind which is moſt eaſily ſeparated in the *Parotides*; for then the whole Quantity of *Lentor* will be derived that Way, and lift thoſe Glands up into a Tumour, and which Tumour, if it does not obſtruct the ſalival Ducts, or occaſion by its Preſſure a Reflux of that

Matter back again to the Generation of another *Lentor*, will prove ſalutary, and the Fever will terminate by Spitting; but if either of theſe, or both happens, it will make the Caſe bad.

Conſequences.

But becauſe whatſoever is moſt dry, compact, and unmanagible in the Blood, is yet left behind, and adheres to the Arteries, and there is an Abundance of watery Humours preſſed out from ſuch obſtructing Viſcidity, and which are diſtributed through the whole Habit; there will nothing therefore of a natural Aliment be carried to the Parts which require it, but ſomewhat in its Stead that is watery and fluxile, not only in it ſelf, but diſpoſed to make the Parts ſo alſo; wherefore they muſt be but ill nouriſhed; that is, a *Cachexy* will enſue with all its cuſtomary Attendants: And hence it will happen, that all the Limbs and *Viſcera* will be reduced to the utmoſt Imbecillity, ſo that they will be expoſed to Suffuſions of aqueous Humidities on all Sides, when they will collect either in the greater Cavities, or in the Interſtices of the Membranes, whence will proceed a *Dropſy*. But this may alſo happen in Parts of greater Firmneſs, and in a leſſer Accumulation of cold Humours, if ſo that by ſuch a *Lentor* are generated obſtinate and large Obſtructions, lifting up a Part into ſuch Tumours as preſs upon the Lymphatick Ducts; or if it be upon the Veins in ſuch Manner, that by their Contacts there is made ſuch Compreſſion againſt them, as to ſqueeze out through their Coats a Lymph, that being collected in the larger Cavities will occaſion a *Dropſy.*

Laſtly, If this Fever is of long Duration, and the febrile Heat hath arrived to ſuch a Condition by its Duration, that hath abſorbed or exhaled the whole Humidity, leaving only the *Lentor* behind, the whole Conſtitution of the Humours will in this Caſe be changed, and of the ſolid Parts too, into an hot and dry Temperament; wherefore, according to what was above proved, muſt enſue an *Hectick.* It is therefore manifeſt that the *Concomitant* and *Subſequent* Affections to a *continued Periodick Quotidian*, do neceſſarily depend upon a Blood ſo vitiated, that it becomes more viſcid, or compact, the Activity of its Heat being maintain'd and augmented at the ſame Time, or from a vitiated Quality in the Blood; which was to be demonſtrated. In the third Place therefore be it laid down, that the whole Series of Affections hitherto explained, do not neceſſarily depend upon a Blood vitiated in its Motion or Quantity; for the Blood being vitiated in its Mo-

Motion or Quantity, is not the Cauſe of all theſe Appearances; nay, there is one or more of theſe Affections, that neceſſarily depends upon a *Lentor* in the Blood, and from whence, although there was no Diſorder in its Quantity or Motion, all the enumerated Affections would flow; and therefore the whole Propoſition is proved.

PROPOSITION XXIII.

The Fevers belonging to a continued Periodick Quotidian, *and what is this very Fever.*

Although it is much diſputed amongſt Phyſicians about the Eſſence of this Fever, yet there are not wanting ſome who deny even its Exiſtence; but to avoid this Queſtion, that is, whether there is in Fact ſuch a Fever, or not? or can poſſibly happen ſuch an one? we ſhall proceed to explain what is poſſible to happen, and thence it will appear, that a Fever may be given wherein the inner Parts are hot, and the external affected with both Heat and Cold at the ſame Time. And this is eaſie enough to happen and be conceived; for ſuppoſing the Body to be affected with a *Lentor,*

An Epiala.

Lentor, that is not uniform, but different in its Compoſition, ſo that from ſome Parts of the ſame *Lentor* the Heat cannot be expreſſed, and that from other Parts it may be diſengaged; and ſuppoſe that a *Lentor* thus circumſtanced is diſtributed into the Arteries of the whole Body, then both Kinds will produce its proper Effect, which will be perceived in every Part where the *Lentor* adheres; and therefore where the frigoriffick *Lentor* obſtructs, there will be a Senſe of Cold; and where the caloriffick, a Perception of Heat; and this will happen in every aſſignable Space of the Body, how ſmall ſoever, as both *Lentors* are ſuppoſed to ſubſiſt in their minuteſt Diviſions, that is, divided into their utmoſt Minuteneſs; whence it will come about that both the Patient himſelf, and any one who lays his Hand upon his Fleſh, will perceive at the ſame Time both Heat and Cold interſperſedly blended together upon the ſame Part; that is, that there is an *Epiala*, which is a Fever, wherein at the ſame Time the moſt minute Particles are in Exceſs of Cold and Heat, as *Galen* himſelf deſcribes it.

But, Secondly, let the *Lentor* be ſuppoſed of ſuch a groſs Conſiſtence, that it is not only unable to paſs the minuteſt Canals of the Body, but alſo thoſe of much greater Capacities; the whole of that therefore, which is very groſs and viſcid, will be collected in the larger Arteries, from whence whatſoever Particles of a more hot and active Nature come back through the Veins with the refluent Current, will again be entangled and reſtrained, inſomuch that it loſes its Power of giving any Perception of Heat, whence the Inwards will feel cold; but then by Compreſſure the Heat will be again forced out of this *Lentor*, and carried to the capillary Arteries, or the external Parts of the Body, whence they will grow warm; and what thence gets through, and is again conveyed into the larger Trunks, will again be entangled in the old *Lentor*, inſomuch that it cannot any more than before excite any Perception of Heat in thoſe greater Veſſels; from whence there will reſult a Fever, when through its whole Circuit the internal Parts will be cold, and the external hot; and which Kind of *Epiala* is deſcribed by *Avicen* and the *Arabians*. But whether this Kind of Fever is reducible only to a *continued Quotidian*, is to be determined by its Periods, nor is it any great Matter to what Claſs it is moſt reducible.

An humoral Syncopalis.

Becauſe in this Fever there is ſuppoſed a great Quantity of phlegmatick and crude Humours, there muſt therefore be produced a very conſiderable *Lentor* from ſuch a cold and watery Diſpoſition; wherefore in the Acceſſion chiefly of this Fever, that is, in the firſt Accumulation of its *Lentor* in the capillary Arteries, the Juices may be ſeparated in thoſe Glands to which they circulate, before they are too much obſtructed, after the ſame Manner as in a natural State, only ſomewhat more viſcid: But theſe, by Means of their *Lentor*, will occaſion uneaſie Senſations, and ſuch ſtrong Efforts upon the Nerves, where they happen to be derived in Cavities where they are plentifully diſperſed, as will waſte a great deal of their Spirits; and this will alſo the more eaſily be affected at a Time when the Spirits which are ſeparated in the Brain are both fewer in Quantity and more watery, or leſs fit for the Diſcharge of the natural Functions; in which Caſe, any ſtrong Undulations will make great waſte of them, inſomuch as to impair the Strength, and reduce a Perſon to a State of Liſtleſneſs; and in this Caſe a ſudden Pain will happen in the Part whereinto ſuch viſcid Juice is drained before the Strength decays, and any thing of ſuch a Derivation is perceived.

Since therefore the inner Coats of the Stomach is covered with Glands, wherein a certain Humour is ſecerned, in the Acceſſion of this Sort of Fever there will be generated a viſcid Juice, which will be drained into the Stomach; and there adhering to its Coats, with a Motion ſenſibly inſinuating into, and diſtracting them, there will be produced a girding Sort of Pain with great Uneaſineſs; and this Senſation may make ſuch vivid Undulations of the Fibres, as in a Scarcity and Poverty of Spirits will in a little Time quite diſable them from Motion; that is, there will be a *Syncope*: And the more ſtrong will ſuch Vibrations be, although the Senſation is not ſo great, becauſe the Nerves diſtributed to the Mouth of the Stomach are very conſiderable, and make very great Re-undulations into the adjoining Parts, ſo as to produce the higheſt Degree of *Impetus* where their Concourſe is greateſt. But a *Syncope* may alſo happen where the Reflux is not ſuddenly communicated with ſo conſiderable a Concuſſion and Agitation of Spirits as immediately diſſipates them; and that is when ſuch Reflux extends to the Cardiack Nerves, which communicate with thoſe of the Stomach, and the Motion of the Heart is thereby ſo much quickned, that between every Contraction there is not Time enough allowed for the Blood to fill the Auricles and Ventricles, on which Account there will be neither Pulſe, nor Secretion of Spirits, nor any Derivation of them, which are already generated into the Nerves, and Muſcles, and Inſtruments of Senſation and Motion; for the Blood will not be circulated into the Arteries of the *Pia Mater*, which by their Dilatation are to compreſs the Brain, and ſqueeze out its Contents, and the Blood is the Promptuary, whence the Spirits are elaborated; and therefore in theſe Circumſtances will there be a Decay of Strength, and this perhaps is the moſt common Way of producing a *Syncope* at Stomach in this Kind of Fever. Here then muſt enſue an Imbecillity of the Body, and a ſlow and weak Pulſe; but when ſo much Blood can be accumulated as to overcome that additional Force of Contraction in the Arteries, then the Pulſe will be ſomewhat more full; and as ſome Spirits will from thence be ſecerned, it will grow alſo ſtronger; but this Tenour will be very inconſtant and uncertain, unleſs the ſame Senſation of Pain continues, and much the more when ſuch Senſation is not uniform, as the refluent Undulations which occaſion it are in themſelves unequal.

The *leſſer Syncope* hath in it nothing peculiar that requires any ſeparate Explication; for whatſoever happens in that comes from a Senſe of Pain in the Stomach, not excited by thick and viſcid Humours, but from ſuch as are ſmall in Quantity, thin, ſharp, and ichorous; which is ſufficient for the Effect, without any Help from a Poiſon or Venom, when it is more eſpecially very active and ſtimulating. Whether both theſe Kinds of a Fever are reducible likewiſe to a *Quotidian*, we ſhall not diſpute, becauſe it is of no great Moment to the Knowledge of Diſeaſes. They who would be informed of all that belongs to a *Syncope* in general, further than what concerns that which affects the Stomach only, may conſult our Diſcourſes concerning the *Diſeaſes of the Breaſt*.

A continued Periodick Quotidian is therefore a Fever, conſiſting in a Fault of the Blood in Quality, wherein it becomes leſs fluxile, by Means of a *Lentor* which recurs every Day, leaving always behind it its more dry Parts in the capillary Arteries, while the thinner Parts flow through; or where the thinner Parts waſt by Perſpiration, a *Lentor* of like Kind may be ſupplied to that Portion which remains in the Capillaries, from ſome of the *Viſcera* every Day, which ſhall alſo after a Fit leave ſome of its dryeſt Parts behind in the ſame Capillaries; and this will be the Caſe every

Day as long as a Perſon is ſaid to labour with this Fever; wherefore the whole *Propoſition* muſt be true.

PROPOSITION XXIV.

The Antecedents *to a* continued Periodick Tertian *may vitiate the Blood in Motion, Quantity, or Quality; but its* Concomitants *and* Conſequences *do neceſſarily flow only from its vitiated Qualities.*

How its Antecedents *operate.*

It is manifeſt that Exceſs of Bile, a hot and dry Temperament, either of ſome particular Part, or of the whole Body, muſt be accompanied with an extraordinary Heat, from whence the Spirits ſecerned into the Nerves will be more ſharp, and the Blood be vitiated in its Motion; The Quantity of Blood will alſo in this Circumſtance be vitiated, for whatſoever is of a watery Nature, or ought to be ſo, will be evaporated; ſo that the whole which ought to circulate through the Veſſels will be leſſened by ſo much, as its aqueous Humidity, in a natural State, added to it: The Blood likewiſe will be diſordered in its Qualities, becauſe by its greater Agitation from an additional Heat, it will become more ſharp, active, and dry, inaſmuch as its more humid Parts are loſt. And theſe Conſequences will not only be brought about by a hot and dry Diet, and in the Time of Youth, but alſo from Faſting, and too ſparing a Nouriſhment; for Faſting occaſions the Humidities to be both ſpent for the Recruits of the Parts exhauſted, and by Watching, which we are moſt ſubject to under ſuch Uneaſineſs, for in that State there is more Agitation, and a greater Conſumption of diſſipable Juices; and a ſparing Nouriſhment is only a Progreſs towards, or a Beginning of Faſting. This is alſo the Effect of frequent and violent Exerciſe; for in that State, by the ſame Means, is the Body drained of its due Moiſtures, inſomuch that the Remainder is more dry, and the Heat made more intenſe; the like from Heat of Air, whether from the Seaſon of the Year, or immediately from the Sun's Influence, or Bathing, *&c.* Suppreſſion of bilious Evacuations, too much Watching, Trouble of Mind, and the like.

How the Concomitants.

Since then the aqueous Humidities are drawn off by the Cauſes which after this Manner bring on a Fever, and whereby the Blood is rendred very fluxile, and its Heat ſharp and vivid, after ſuch Humidity is quite ſpent, the whole Maſs will grow leſs fit for Motion, and more viſcid, with a further Increaſe of Heat, or a *Lentor* will be produced of conſiderable Moment, and by Means of its Dryneſs, and containing but a very ſmall Portion of Humidity, extreamly adhæſive; but yet ſuch as will admit its igneous and fluid Particles, upon certain Conditions, to get at Liberty. This *Lentor* therefore will be more tenacious than that which produces a *continued Quotidian*; when therefore it arrives at the capillary Arteries, its moſt viſcid Parts will adhere to their Coats, while the hot and fluxile Particles make their Eſcape from it; but as theſe more liquid Particles, which are expreſſed from a *Lentor*, are more tough and dry than that which produces a *Quotidian*, *theſe* will in like Manner be more viſcid than thoſe which are expreſſed from *that*, wherefore they will flow through the Veins more ſlowly; whence they will not again be brought back to accumulate in the capillary Arteries every Day, but every other Day, or there will be a Return every third Day; and as the moſt tenacious Parts of the *Lentor*, and that which is moſt dry, yet adheres in the Arteries, the Heat will be ſo long continued. The ſame alſo will happen, when to that dryed *Lentor* which adheres in the Arteries, there is not a like *Lentor* ſupplied from the Veins, but from ſome of the *Viſcera*, or any other Part of the Body; the Acceſſions will therefore be without Cold, or Shaking, as appears from what hath been in general premiſed in the foregoing *Propoſitions.*

Further, the Terminations will be without any Sweat, in the ſame Manner, and for the ſame Reaſons, as explained in the preceding; unleſs when in a *Tertian* the generating Cauſes are ſuch as waſte the Humidities, even from the venal Blood, and the cutaneous Glands lye ſo open, that the thicker or moſt viſcid Parts of ſuch aqueous Moiſtures can tranſpire through them.

The Differences of Pulſes may be alſo underſtood from the ſame general *Propoſitions.*

When therefore the Heat is thus defrauded of Moiſture, whereby its greater Activity and Force ſhould be reſtrained and mitigated, its *Momentum* will be very conſiderable, whence it will excite a very intenſe Perception, ſuch as is diſcernable in the kindling of dry Wood, when all its Moiſture is diſſipated, and therefore ſuch Heat will be burning, and very penetrating to the Touch, becauſe it evaporates without any Contemperation from Moiſture; wherein it differs from the Heat of a *Quotidian*, which at the firſt Feeling is moderate, as it riſes mixed with aqueous Particles, by which its Sharpneſs is mitigated; nor does it increaſe in Activity, unleſs by a Continuance of the Hand upon the Patient for ſo long a Time that the Particles of Heat accumulate under the Touch, which Circumſtance we have omitted in our Deſcription of that Fever.

In this Caſe Sleep is diſturbed and but little, becauſe there is but little Humidity left in the Body, although in other Reſpects there were leſs Action and Motion; for in this Condition of Blood there is not only a Diminution of Moiſture, but an Augmentation of Heat; in this State therefore, that is, in a *Tertian*, there will be Reſtleſneſs, and interrupted Sleeps. And in ſuch Sleep as this, Dreams are eaſily excited, wherein the Imagination is greatly agitated by the increaſed *Impetus* of hot and dry Spirits in the Nerves; which as they are ſuch alſo as excite Rage, ſuch Dreams will be full of Starts and Anger. *Deliria* ariſe from the Force of the Spirits breaking out on all Sides without any Regularity, and exciting this or that Species, as they chance to vibrate the Fibres in this or that Part; and as theſe too muſt dry the Nerves on that

Account, they will fall into Tremors, and be more ſuſceptible of Impreſſions from ſuch Species as are excited in them, and there will be falſe Appearances of Images; that is, there will be a *Delirium.*

Upon ſuch a Conſumption of Humidity alſo there will be a Scarcity ſecerned by the ſalival Glands; and as the Spittle is in its ſelf a viſcid Juice, when its aqueous Parts, which ſhould render it fluxile, are waſted, there will either little or none be ſeparated, or it cannot flow through its proper Ducts, or the Apertures of the ſecreting Glands leading into thoſe Ducts will be obſtructed by the *Lentor* flowing in the Arteries, or all theſe may happen together, whence there muſt ariſe a great Thirſt, and a ſcorching Heat in the Mouth, becauſe the igneous Particles in this Circumſtance act upon a Body deſtitute of Moiſture; nor will this Thirſt be perceived only about the Mouth and Jaws, but there will be a Dryneſs throughout the whole Body accompanied with intenſe Heat. From the Conſumption of this Humidity, which ſhould moiſten all the Membranes, and a Want of due *Saliva* in the Mouth, the Tongue muſt neceſſarily grow dry and black, either from a dry and ſtagnant Blood in the Capillaries of that Part, which at length, as in a Flea-bite, turns into Blackneſs, or from a Tincture of Bile, which filters up from the Stomach along the Coats of the OEſophagus, and tinges the Tongue with that Hue, and which, although it is not black in the Stomach, yet when dryed upon the Tongue, and accumulated there in ſome Quantity, it will change into Blackneſs; and that this muſt be the Caſe, is neceſſarily evinced by the Bitterneſs in the Mouth, which is an irrefrigable Argument of the Exiſtence of Bile at Stomach; and the Cauſes of a *Tertian*, all favour the Generation of Bile, which therefore in this Fever will accumulate in Quantity, as appears by the enumerated Symptoms.

Becauſe likewiſe in this State of the Blood a great deal of its natural Humidities are exhaled, therefore the groſſer Particles will have greater Difficulty of Circulation along with it: And thus at the Acceſſion of the Fever, wherein the compreſſive Powers are leaſt, ſuch Particles will be but little ſecerned, becauſe in ſuch a Circumſtance the more aqueous and fluid will paſs the Strainers, and leave the groſſer behind in Complication with the remaining Blood, and ſtill leſs fluxile by the Loſs of that aqueous Vehicle that ſhould keep ſuch Parts from Coheſion and Contact: But by the Succeſſion of an augmented Heat, the contractile Motion will be increaſed, whereupon thoſe Particles that were before moſt unfit for Motion will be ſeparated, and derived into the Ureters and Bladder; and as they are then in an over Proportion to the watry Parts in the Urine, they will raiſe its Colour, and make it look inflamed and red; by reaſon of an aggravated Heat alſo in all the Humours, the Urine will be ſharp, hot, and pricking; which Perception likewiſe will ariſe from the Aſperities of earthy and ſaline Particles, for they being then leſs covered by a Mixture of Humidity, will more ſenſibly vellicate, and prick the Membranes in their Paſſage.

Why a Loathing at Stomach, with bilious Vomitings and Stools, are the Attendants of this Fever, may eaſily be conceived from the foregoing *Propoſitions.*

But great Reſtleſneſs will alſo happen in this Fever, becauſe therein the Blood falls into the higheſt Rarefaction, and a great Energy of Heat, ſo that after it hath finiſhed many Circuits, the whole Maſs will be broke into Parts that are dry and fixed, and into ſuch as are hot and active; ſo that it will in a

Manner boil, and that with a great *Impetus*, on all ſides, eſpecially in the larger Veſſels, in which it is immediately received from the Heart with Force, as in the Trunks of the *Aorta*, and the pulmonary Artery; whence the Lungs will ſuddenly take it in, and force it out again with ſuch an *Impetus* and Rarefaction, as is eaſily conceived to happen in a Fluid thus circumſtanced: On this Account the Patient will on purpoſe quicken his Reſpiration, partly from Pain, in order to throw off the offending Cauſe, and partly by Means of Dryneſs in the Lungs, which cannot contract and expand, ſo much as a more deliberate Reſpiration does require, and partly alſo from the Heat's acting as a *Stimulus* upon the intercoſtal Muſcles, and partly from an Acrimony of the Spirits in general, which will occaſion a more uncertain and a more frequent Contraction without any Directions from the Will, in whatſoever Part of the Body they happen to meet with a ſharp hot Blood, and conſequently be the Cauſe of Reſtleſneſs when we heed not our Actions, or ſometimes ſtrive to reſtrain them.

And Conſequences.

But by this Time let us ſuppoſe the *Lentor* which adheres to the Arteries to be ſo pliable in its Conſiſtence as to admit of its Separation therefrom, although it cannot be quite diſſolved, or reduced to Fluidity; it will therefore be leſs dry, though it will not always happen to be fluid enough to paſs into the Veins, ſooner than every Day, or every other Day; but if this Abſtertion gradually goes on, when a leſſer *Lentor*, thus broke away, cannot get back into the Veins unleſs every third Day, a *Lentor*, much more difficult of Motion, although moiſtened enough to be waſhed off the Coats of the Veſſels, and carried away in the Stream, will more ſlowly move along the Superficies of the Veins, or return into the Arteries but every fourth Day; in the ſubſequent Circuits therefore no Blood will obſtruct in the Arteries, wherefrom Heat may continually be looſened and put into Action; whence after it hath paſſed out of the Arteries into the Veins, the Fever will ceaſe, and the Patient remain well ſo long as it ceaſes to reaccumulate in the Arteries, or there will ſucceed an *intermitting Quartan*. And becauſe Autumn hath a ſhare of Cold, if not alſo of Moiſture, on the Approach of that therefore the Heat of the Fits will mitigate, when the Quantity of Humidity is not increaſed; and the Patient will not any longer be ſo much dried even with an internal Heat, upon a Defect of that in the Air; becauſe the Humidities which are taken in will ſtay longer in the Body, ſo as by Degrees to ſoften that dried *Lentor*, whence an *intermitting Quartan* will ſucceed *a continued periodick Tertian*, eſpecially if it be in Autumn. It does therefore appear that all the *Concomitants* and *Conſequences* do neceſſarily depend upon a vitiated Quality of the Blood. In the Third Place therefore it is alledged, that the whole enumerated Series of Affections here explained do not neceſſarily depend upon a Blood vitiated in Motion and Quantity, and which is demonſtrable after the ſame Manner as in the *Twenty ſecond Propoſition*. And therefore the Whole of this is true.

PROPOSITION XXV.

The Fevers belonging to a continued Periodick Tertian, *and what that it ſelf is.*

Since we treated particularly about a *Cauſus* before, and ſingly explained its Affections, we have nothing here further to examine beſides its Period, which

A Cauſus.

which is to be fetched from the ſame Cauſe as the Periods of a *Tertian* already explained; that is, when a *Cauſus* is not with a perpetual and equable Heat, and without Exacerbations, but with Exacerbations, and having its Acceſſions, Augmentations, Height, and Terminations, under the ſame Conditions of that. When therefore a *Cauſus* hath the ſame Types, or Periods, with a *continued Periodick Tertian*, it is in it ſelf nothing elſe than a *continued Periodick Tertian* more aggravated.

A Colliquans.

Suppoſe this *Lentor* to be ſo obſtinate and dry, that its whole Heat be compreſſed out of it, and whatſoever it had acrimonious in its Compoſition, ſo that together they get Liberty, and take their Courſe through the Blood-Veſſels; when therefore they are brought into Contact with any of the ſolid Parts, they will not only be unfit to nouriſh and recruit them, but, on the contrary, as they are deſtitute of an agglutinating Moiſture, which ſhould fix, retund, and contemper their eroding, diſſolving, and active Qualities, they will endeavour to ſeparate them in their natural Contextures; and as they have a great *Impetus*, they will ſhake and ſeparate them from their Contacts; that is, they will diſſolve the Texture of their Parts; from whence thoſe Particles in Solution, and floating with the Blood in its Veſſels, will arrive at the ſecretory Glands, and be ſecerned in ſuch of them as are fitted for the Separation of natural Humours of like Textures and Fluidities.

Becauſe therefore by ſuch a Blood as this, the Body is not only not nouriſhed, but, on the contrary, wore away and conſumed, there will enſue a ſudden Emaciation or Leanneſs; and as every Part ſuffers in ſuch a Waſte, that which is naturally required to fill up the Cavity of the Eyes will loſe of its Quantity, and conſequently will they ſhrink in their Sockets; and as they are tied moſtly backwards, will they draw inwards, and leave a ghaſtly Hollowneſs in their Appearance. The Temples will likewiſe fall; that is, the temporal Muſcles will ſhrink cloſer to the Bones to which they are fixed, and there will be in Reality a Waſte of their Subſtance. From the ſame Reaſon does the Noſe grow ſharp; for ſo long as the Interſtices of the cartilagineous Parts are filled with proper Subſtance, and the Cartilages themſelves are thicker, that Angle which is made by the Tip of the Noſe with its *Alæ* or Wings will be greater, or leſs acute; but when ſuch Subſtance is wore away, or dryed, or conſumed in any Reſpect, the Noſe will ſeem to ſhrink into it ſelf, and become very ſharp at the Tip. But very great Emaciations of this Nature may happen to the whole Body, without any manifeſt Conſumption by any of the ſenſible Evacuations; that is, when the Matter wore off from the Subſtance of the Parts is of that Kind, as will admit of Evaporation by inſenſible Steams through the Surface, without any glandular Secretion through the Membranes, and viſible Appearances of Loſs. If this deterged Subſtance ſhould indeed be changed into ſuch a Nature, as would fit it for Separation in the Kidneys, it would then go off chiefly by Urine; if in the Glands of the Skin, by Sweat; if in the Glands of the Inteſtines, or Stomach, or Pancreas, by Stools; diſcovering the Contents of the Glands that moſt ſupplied them, if in the Liver, by Stools that are very bilious, and wholly ſo where that alone is affected; but where there is a Mixture from other *Viſcera*, there will be a Compoſition of all. The Stools will be frothy, by the Activity of the igneous Particles, and other Particles that are very light, which breaking forth ſuddenly and with Force, lift what they are entangled with up into Bubbles: They will be differently coloured according to the Diverſities of the Matter ſupplying them; they will be greaſy from the Solution of Fat; viſcid and bulky, from the Solution of more ſolid and groſs Parts; and ſetid from the Mixture of Particles extremely active, and ſtriking the Membranes of the Noſtrils with great Force. And in this Sort of Fever not only one or another of theſe Affections will happen, but many, or all of them, in the ſame, or different Days; nay poſſibly in the ſame Hour, as this or that Part is diſſolved, and runs into a Matter of this or that Kind, ſuited for Separation by Stool, by Urine, by Sweat, or by inſenſible Tranſpiration.

The Elodes. To this *colliquative* Fever is reducible the *Elodes*, or ſweating Fever, wherein there is great Profuſion of it continually; and this Kind is either milder, and capable of fuſing only what remains in the Parts of a watery Nature; or if it is of long Duration it becomes fatal, as it runs alſo thoſe Salts which make great Part of the Sweat, and diſſolves the moſt intimate Cohæſions and Compage of the ſolid Parts: And both theſe Kinds may come from a Ferment that has a Faculty of fuſing and melting, and which is in it ſelf very ſubtle; nay, in this colliquative Diſpoſition it is difficult to admit Heat, and other very active Particles, as the ſole Cauſes of diſſolving the moſt ſolid Parts of the Body, and not that dry *Lentor* which adheres to the Arteries; and the Fuſion of which *Lentor*, if it ſucceeds, will be as a colliquative Ferment it ſelf in the Blood, and from thence this very Kind of Fever may ariſe, as it hath been made appear in the general *Propoſitions.*

And Aſſodes.

Laſtly, As the *Aſſodes* produces a great and frequent Reſtleſneſs and Toſſing about, that happens from the Senſe of Heat, which makes the Patient covet a freſh cold Place in the Bed to mitigate it, or from a *Lentor* adhering in the Arteries, which hath ſome other Perception, or Senſation of Uneaſineſs joined along with it, or an intolerable Heat. But whence the Loathing, Vomiting, Gnawing, and Irritation at Stomach, and its neighbouring Membranes, *&c.* may be underſtood from the foregoing *Propoſitions.*

A *continued Periodick Tertian* then is a Fault in the Blood's Qualities, wherein, by Means of a certain *Lentor*, the Blood is rendred leſs fluxile, whoſe more viſcid Parts remain in the Arteries, whilſt its more fluid paſs through into the Veins, finiſhing its Circuit to the Capillaries again every third Day; or where it is waſted and perſpired in the Fit, it is ſupplied again from ſome Part of the Body in like Manner every third Day, as it hath been before ſaid of a *Quotidian*, changing only the Order of Time, wherein the Returns happen; from every Day into every other Day. And therefore the whole *Propoſition* ſtands demonſtrated.

PROPOSITION XXVI.

The Antecedents *to a* continued Periodick Quartan *may vitiate the Motion, Quantity, or Quality of the Blood; but its* Concomitants *and* Conſequences *do neceſſarily depend upon its vitiated Quality; and what this Fever is.*

How its Antecedents *operate.*

A dry and lean Habit of Body is a certain Argument of dry Humours, that are deſtitute of Moiſture and Softneſs, becauſe it is that which lubricates the Parts, and fills them with Fat: A dusky and obſcure Complexion denotes the ſame Qualities, ſince all Tranſparency is thereby loſt, and ſuch a Condenſation obtained as is the Conſequence of dry and earthy Particles, both which are attended with Dryneſs and Coldneſs together. And theſe Qualities will yet become the more remarkable from a cold and dry Temperament jointly, whereby a Blood is generated abounding

ing with the ſame Qualities; the like alſo from a declining Age, becauſe then the Body grows dry and cold; in like Manner Autumn inclines to the ſame, when it is of the ſame Conſtitution in Qualities, or although it be partly cold and dry, partly cold and moiſt, and again cold and dry, or hot and dry, or hot and moiſt; for from any of theſe Inequalities of Conſtitution it comes about that the Heat or Dryneſs happening upon Moiſture will neceſſarily make ſome Waſte of it. Much Care and Anxiety alſo affects the Blood after the ſame Manner; for by ſuch Agitations of Mind, there is not only a Waſte made of the natural Moiſtures, but leſs Liberty of Motion is allowed to the Heat, by Reaſon of the languid Contractions of the Solids; ſo that the Blood, for Want of its Humidity, grows dryer and colder, through an Implication of its igneous Particles for Want of Motion.

From a Suppreſſion of the Hemorrhoids, the Blood may grow more cold and dry, as often as the Blood ſo to be evacuated is circumſtanc'd, as Phyſicians generally ſuppoſe it to be, that is, dry, groſs, and cold; tho' it is not in Reality ſuch, unleſs the whole Maſs partakes of the ſame Qualities, and in that Caſe a Suppreſſion of the Hemorrhoids only is a Means to increaſe the Quantity of a diſtempered Blood: And thus a Tumour in the Spleen may occaſion a dry and cold Blood, by giving to it a Mixture of Particles endewed with thoſe Qualities, and from which the Tumour was occaſioned; and this Matter in the Spleen is undoubtedly in the greateſt Degree a *Lentor*, becauſe from its very Structure it appears that nothing but what is very groſs ever flows through it: But unleſs ſuch a Tumour is raiſed from ſome Fault of the Spleen in its firſt Conformation, or from ſome Fault ſince occaſioned, it could not be there produced from cold and dry Matter, without ſuch Particles before abounded in the Blood.

The *Antecedents* therefore to a *continued Periodick Quartan*, by Means of a dry and cold Blood, generate fewer and leſs vivid Spirits, and on that Account diſorder the Blood in its Motion, and alſo in its Quantity, by a Want of its due Humidities: Its Qualities muſt likewiſe be vitiated, becauſe ſtrictly a cold and dry Blood is not natural to the Body of any Animal, and particularly that of a Man. The Blood then being granted to be cold and dry, there will be in it a Sluggiſhneſs, or a *Lentor* in the higheſt Degree reſiſting Motion; for as the Quality of Dryneſs is in it ſelf very oppoſite to Fluidity, and there is no

Humidity ſuppoſed to be mixed with it, by which it would be rendred more fluxile; and alſo as by Coldneſs, which is added to that other Quality, there is put an Inability or Deadneſs upon the moving Powers, and upon that Aptitude to Action which is received from Heat, it cannot but happen that from both theſe Circumſtances jointly there muſt enſue a *Lentor* in the Blood, that will be very difficult to be ſet in Motion.

How its Concomitants.

But becauſe in this Condition there is not a total Impediment to the Exertion of Heat, and as that which makes its Eſcape is under no Reſtraint from Humidity, ſuch a *Lentor* will be joined with ſome Meaſure of Heat: And from hence it comes about that when it is accumulated in the capillary Arteries, it will adhere to them, and that very obſtinately, by Reaſon of its great Degree of Dryneſs; but it will not yet adhere ſo as to hinder all Manner of Diſengagement of igneous Particles, whence even its Acceſſions may come on without any Perception of Cold. But whereas this whole *Lentor* is much more dry than that which produces a *Tertian* or a *Quotidian*, therefore even its more liquid Parts, which are waſhed from it by the preterfluent Blood, and carried with the Stream in the Courſe of Circulation, will be more viſcid than that which produces the Returns of a *Quotidian*, or a *Tertian*; and therefore will it more ſlowly move along the Veins, and will not re accumulate in the Arteries but every fourth Day; either becauſe it requires ſo much Time to finiſh its Circuit through the whole Length of the Canals it is obliged to circulate in, before it can reach back again to the capillary Arteries; or becauſe it cannot in a leſſer Space of Time ferment, maturate, or be generated, as before explained.

Its Terminations will be without Sweat for the ſame Reaſons, as it happens that a continued *Quotidian* or a *Quartan* do go off in like Manner without Sweat: and further, in this Fever it more particularly holds, becauſe the Viſcidity of the Humour is extremely great; as it is manifeſt from the Propoſition before us, that the Blood whence they are to be derived, and would otherwiſe admit of Exſudation through the Pores of the Skin, is in the higheſt Degree thick, dry, and adhæſive.

The Differences of the Pulſes are manifeſt from the general *Propoſitions*; but becauſe the *Lentor* is ſuppoſed colder, that is, colder than in a *Tertian*, as above explained, the Quantity therefore of Heat which eſcapes will be leſs, and therefore a leſs Perception of it through the Body; that is, there will be a weaker Heat than in a *continued Tertian:* But further, becauſe this cold *Lentor* is not accompanied with ſuch an Humidity as might repreſs the Activity of its Heat, but with the Quality of Dryneſs, whereby the igneous Particles without Mixture act on all Sides without any Check, and penetrate through the Subſtances of the Parts, as it were naked, whereas in a *Quotidian* they riſe with ſome Mixture of Humidity; the Heat therefore of a *Quartan*, on Account of its Smalneſs in Quantity, may be leſs than in a *Tertian*; but for Want of Humidity to reſtrain its Activity, and mitigate its Sharpneſs, it may communicate a brisker Perception than in a *Quotidian:* But becauſe where the Heat hath greateſt Power, there the ſolid Parts will be moſt dryed; and where there is the greateſt Dryneſs, there is the greateſt Thirſt; when therefore in a *Quartan* the Heat is leſs than in a *Tertian*, but the Want of Humidity greater than in a *Quotidian*, it will happen that there will be a leſſer Thirſt in a *Quartan* than in a *Tertian*, but greater than in a *Quotidian*, becauſe in this that Humidity which is ſuppoſed in the *Lentor* is not totally exhaled.

Further, As the Urine is compounded of hard and watery Particles, and that theſe are by this *Lentor* greatly fixed; by that weak Motion, or leſſer Compreſſion in the Acceſſions, they cannot be ſeparated, nor derived into the urinary Ducts, but the aqueous Parts only will be ſeparated, which will render the Urine crude and thin; but upon the Increaſe of the Fever, the compreſſive Force will be raiſed, whence the groſſer Parts will be alſo ſet at Liberty, and excerned by Urine, whence it will be higher coloured, and more digeſted; but becauſe theſe Particles are ſet at Liberty, and diſengaged from a very dry Blood, they will not be equally diſpoſed for Separation with the Urine, and Solution therein, ſo that the Urine will be more crude, or more concocted, according to the Diſpoſitions of ſuch Particles to be carried through all the ſecretory Windings, and diſſolved by the aqueous Parts of the Urine. But becauſe by Nature we are moſtly inclined to Heat and Moiſture, and for the moſt Part we are nouriſhed by Meats that partake of the ſame Qualities, and even to the Meaneſt, Plenty of Water is not wanted for their common Drink; therefore the Blood can ſeldom be ſo far vitiated, as to become both cold and dry, or to contract a *Lentor* that will produce a *Quartan*, and conſequently a *continued Periodick Quartan* will hardly ever happen: But when it does come, becauſe by Viſcidity and Coldneſs of the Blood there are very little Spirits generated, and great Inaptitude to Motion occaſioned; and alſo that there is very little of that left in the Blood, which, when mixed in the nervous Juice, will contract the Muſcles, and in Plenty of which, Strength and Health conſiſts; therefore a Fever ſo circumſtanced muſt occaſion great Dejection and Faintneſs. But all the other *concomitant* Affections of a *continued Periodick Quartan*, are to be underſtood from their Explanation under an *intermitting Quartan.*

Further, Becauſe ſuch an obſtinate Degree of Coldneſs and Dryneſs cannot but with Difficulty be warmed and moiſtened, hence it happens that there is more Time neceſſary before it can be accompliſhed, and therefore the Fever may be protracted for 40 Days or more; and unleſs then the *Lentor* is deſtroyed, as there is nothing conſentaneous to Nature in ſuch a cold and dry Blood, there muſt enſue a depraved Conſtitution, or a Cachexy, or its Conſumption, ſo as to bring on a perfect *Tabes*, as that is attended with ſuch Diſpoſitions of Cold and Dryneſs; or where a febrile Heat can raiſe a Warmth in the

And Conſequences.

Parts, the Body will then in like Manner waſte through Dryneſs and Heat.

But yet if this dry *Lentor* could in ſome Meaſure admit of a re-moiſtening, ſo as to be waſhed out of the Capillaries, and quite diſſolved, not ſuddenly, but by Degrees, it may finiſh its Circuit through the Veſſels by the fourth Day: for upon its firſt Admiſſion of Moiſture, that which is its dryeſt Part cannot be rendred more fluxile than that which is expreſſed from it more liquid, and therefore a *Quartan* will be produced that is not *continued*, becauſe there will be a Time when there will be no *Lentor* in the Arteries, and between every Return of which ſome Space will be left, wherein the Body will be as in perfect Health, that is, there will ſucceed an *intermitting Quartan.*

In the third Place then it may be affirmed, that this whole Series of Affections does not neceſſarily depend upon the Blood's being vitiated in Motion or Quantity; for a Fault is firſt in the Blood, the Conditions of which may indeed affect its Motion or Quantity, ſo that the whole Series of Affections, as appears from what hath been explained, may alſo ſucceed, but the Differences of Pulſes cannot in many Reſpects be but from the primary Fault therein, whereby it is vitiated in Quality.

A *continued Periodick Quartan* therefore is a Fault in the Quality of the Blood, wherein it is rendred leſs fluxile by Means of a certain *Lentor*, the dryer Part of which adheres continually in the Arteries, its more liquid Part breaking through, and recurring every fourth Day, *&c.* as above explained; the Order of the Returns only being changed, from every Day to every third or fourth Day; ſo that in theſe three Diverſifications of Fevers, the Heat which is diſengaged from its *Lentors*, and circulates through the Blood-Veſſels, will be differently circumſtanced in every one: In a *Quotidian*, what eſcapes will not be alone, but joined with a conſiderable Portion of an aqueous Humidity, with which the *Lentor* of a *Quotidian* abounds; what eſcapes in a *Tertian*, is in greater Quantity, and joined with a leſs Portion of aqueous Moiſture, as the *Lentor* of a *Tertian* is more tenacious and dry, or containing leſs Humidity; and laſtly, what is diſengaged in a *Quartan*, is very little in Quantity, and mixed likewiſe but with very little of aqueous Particles, as the *Lentor* in this Caſe is dry and cold.

PROPOSITION XXVII.

The Antecedents *to a* malignant *Fever may indeed vitiate the Blood's Motion, or Quantity; but its* Concomitants *and* Conſequences *do not neceſſarily depend but upon its vitiated Quality: and what this Kind of Fever is.*

There is nothing more commonly received amongſt Phyſicians, than that a *malignant* Fever ariſes from ſome malignant Quality in the Humours, whereby they contract a Kind of poiſonous Nature, and by Vertue only of this poiſonous Taint, are derivable all the *Concomitant* Affections of a *malignant* Fever. But becauſe alſo a Diſorder in the Blood's Motion and Quantity muſt neceſſarily be the Reſult of thoſe ſuppoſed Malignities, as by that is made a Change, wherein neither the Spirits are ſeparated in due Order, nor the Blood ſupplied in due Quantity, and a vitiated Quality is ſuppoſed; therefore from the Premiſes it muſt appear, that the Blood may in this Caſe be diſordered in its Motion, Quantity, and Quality. But becauſe it is not aſſigned by any what this poiſonous Quality is, or by what Means it operates; if therefore we ſhall ſhew, that whatſoever is joined with, or follows, a *malignant* Fever, is neceſſarily the Effect of a *Lentor*, as already laid down, either rendred more tenacious, or fermentable, or reſolvable into ſomewhat different from a natural Blood, it will then be demonſtrated what is this Malignity or Poiſon; and it will at the ſame Time be made manifeſt, that whatſoever is joined with, or ſucceeds a *malignant* Fever, does not neceſſarily depend but upon the Blood's being vitiated in its Qualities, ſince a *malignant* Fever can differ in nothing from thoſe before deſcribed, but in a greater or leſſer Degree; whether it comes from a more ſtubborn *Lentor*, or from one reſolvable into ſomewhat very different from the natural Conſtitution of Blood, as the *Concomitant* and *Subſequent* Affections of thoſe other Fevers have no neceſſary Dependance but upon a Blood vitiated in its Qualities.

Malignant *Fevers the* Conſequences *of thoſe that are not ſo.*

And firſt of all, that the *malignant* Fevers which moſt commonly happen, do derive their Origin from the ſame *Lentor* as the Fevers already enumerated, does from hence manifeſtly appear, that moſt *malignant* Fevers are the *Conſequences* of ſuch; and of *Quo-*

tidians and *Tertians* particularly, wherein there is a more aggravated Heat, diſpoſing to Fermentation and Solution of the *Lentor*, which in *Quartans* are more difficultly accompliſhed, becauſe therein the Heat is remiſs, and a great Dryneſs attends them, both which keeps the *Lentor* from Fermentation; and thus a *ſimple intermitting Tertian* eaſily changes into a double *Intermittent*, and this into a *Continuent*, and that into a *malignant* Fever. Since therefore all theſe Changes are only from a leſſer to a greater Tenacity and Adhæſion of *Lentor*, as appears from what is above explained; the laſt Degree alſo of thoſe Fevers orderly ſucceeding one another, or a *malignant* Fever, muſt neceſſarily be from the ſame Origin as the reſt; and as thoſe go on from leſſer to greater, even to the utmoſt Aggravation of *Lentor*, the laſt muſt be from the ſame as the firſt, and conſiſt in the higheſt Degree of *Lentor*.

How the Blood muſt be affected in a malignant Fever.

But becauſe with the higheſt Degree of *Lentor* is joined the utmoſt Diſſolution of the Blood's moſt moveable Parts, which are continually acting upon it, in Order to its Reduction and Solution; and as by ſuch Solution it cannot be changed into natural Blood, there will reſult a Fluid in the Veſſels, ſuited neither for Nouriſhment, nor Motion, nor

Senſation; in ſome Parts more groſs, and in other more fluid than natural; for it is not poſſible that it ſhould in all Parts be equally diſſolved, as it may adhere in ſome Arteries, while it eſcapes through others; in theſe it again returns and obſtructs, whilſt through thoſe it paſſes on with Freedom; becauſe whatever is moſt in Freedom of Action, will work upon the *Lentor* in this or that Artery, and force it away, or diſſolve it, as it finds greater or leſſer Reſiſtance in this or that Veſſel, and which is neceſſarily greater or leſſer, according as the Part wherein the *Lentor* is accumulated is endewed with ſtronger or weaker compreſſive Powers; as it hath been already ſufficiently explained.

Appearances at the Beginning of a mild Fever, and a remiſs Heat.

Whether then a *malignant* Fever ſucceeds others, or comes at firſt of it ſelf, let the Blood be as here aſſigned; that is, compounded of a *Lentor*, and other more active Parts, in the higheſt Degree of Solution; and that theſe active Parts gradually operate upon, and diſſolve that *Lentor*; theſe therefore in ſome Meaſure will be embarraſſed therewith, and loſe their Violence; and as amongſt them igneous Particles will be incloſed, until the Solution of ſuch *Lentor* is accompliſhed, the Heat will lie, as it were, buried in it, and uncapable of Exertion; and therefore from hence muſt it come about that its Activity, that is, the Heat it ſelf will be leſs perceived in the Body, for the ſame Reaſon as a Perſon is not ſo much warmed by the Fire when Ice, or any cold Body is interpoſed; on which Account the Fever will ſeem of a milder Sort, as the Heat at the Beginning will be remiſs; ſo that while the worſer Symptoms as yet lye concealed, there will be no Suſpicion of a dangerous Diſtemper.

A great Loſs of Strength, But becauſe all the Strength we are able to make Uſe of is from a Conflux of nervous Juice, with the more active Parts of the Blood in the Interſtices of the Muſcles, ſo long therefore as theſe flow without Interruption through the Arteries, there may and will be a good Quantity of Strength; but when the *Lentor* comes to diſſolve, and mix therewith, they will not flow through the Arteries, or by Means of ſuch Mixture cannot be ſeparated in their proper Strainers, and therefore ſuch Conflux will be deſtroyed; a little after the Beginning then there muſt be a great Decay of Strength through a Defect of the Means to produce it: And as *without any manifeſt Cauſe.* this Combination is in the Blood-Veſſels, and exhibits no other obvious Affection, either to the Patient or By-ſtanders, ſuch Imbecillity will ſeem to be without any manifeſt Cauſe; and in like

Manner, becauſe during ſuch a State of Entanglement, a deceitful Appearance of a mild Fever preſents it ſelf, and the Heat continues moderate, ſuch Imbecillity will ſeem much greater than otherwiſe is accuſtomed to attend Fevers of ſuch a favourable Aſpect. But in the mean Time ſuppoſe this *Lentor* to ferment, and that which obſtructed in the Capillaries to waſh away, and flow through the Blood-Veſſels, not only the Heat then, which was before at Liberty, will begin to act with more Briskneſs, but that alſo will be ſet looſe which was entangled with *Lentor*, whence will ariſe a great Increaſe of its Perception all over the Body.

Inquietude, &c.

But from this Augmentation of Heat, and a Conflux of *Lentor* along with it to all the Parts of the Body, there will Uneaſineſſes ariſe both from the Afflux of *Lentor*, and the Perception of Heat, whereby the Patient will toſs about to find Cold and Refreſhment, and roll about in his Bed from one Place to another. For theſe ſame Reaſons likewiſe will he draw his Breath with great Vehemence and Thickneſs, with Sighings, from a Perception of violent Heat in his Breaſt and Lungs, and a preſſing Weight upon the ſame Parts; for the *Lentor*, as often as it arrives at the Lungs, will occaſion Difficulty of

Paſſage through their Veſſels, and create ſuch a Senſe of Weight and Preſſure; and the Patient fetches very deep and ſtrong Reſpiration, in Expectation to throw off ſuch Uneaſineſs. The Energy likewiſe, or great Quantity of an extreamly hot Blood contained in thoſe Trunks of the *Cava*, and great Artery within the Breaſt, and alſo in the whole Subſtance of the Lungs, will excite ſuch a Senſation there, as any Perſon would naturally endeavour to throw off by thick and deep Reſpirations of cool Air; and which Sort of Reſpiration is in a great Meaſure the Effect of a *Stimulus*.

Irregular Sweats. But while a Fermentation goes on, and the *Lentor* is broke into its conſtituent Parts, the ſaline and aqueous Parts likewiſe get at Liberty, ſo that when the *Lentor* begins to waſh out of the Capillaries, and flow in the Current, it will not obſtruct the Ducts conveying it from the Glands to the Skin, whence its Parts that are at Liberty, and fit to appear in the Form of Sweat, will get through the Pores of the Skin, and cover it with Moiſture; but as this *Lentor* may again recurr, and be ſo cloſely crowded together as to adhere a long Time before it ferments, or may obſtruct the glandulous Ducts, hence it will ſometimes break out in Sweat, and at others not; now more ſparingly, and then more plentifully, from the whole Body, or ſome Part only, as the *Lentor* is more or leſs broke, or diſſolved in this or that Part of the Body, or according to its Returns, *&c.* And every Sweat thus breaking out may be hot or cold, according to the *Twenty firſt Propoſition*: And hence Sweats may be without Regularity, or uncertain in all of their Properties.

Becauſe the firſt of this *Lentor*, or *The Pulſe ſmall.* that which is as yet not at all broke, accumulates in, and adheres to the Arteries, or whether becauſe a great deal of liquid Moiſture exhales out of the Veſſels during the Agitation of a febrile Heat, or whether ſome or all of theſe Circumſtances happen at once; therefore there will be a much leſs Quantity of Liquid in the Arteries, than in a natural State, whereupon the Pulſe will be ſmall. For the like Reaſon both the Quantity of Fluid through the Nerves, and of Blood to influence the Muſcles, will be leſs in Quantity, and of leſs Energy, and therefore will the Heart contract more weakly, whence a leſſer Velocity will be communicated to the circulating Stream, and conſequently the Pulſe rendred weak; *weak.* nay, although the Spirits ſeparated ſhould be ſharper, yet in a leſſer Quantity of Blood they will be ſeparated proportionably fewer, and on that Account alſo the Pulſe will be rendred weaker. When therefore the Spirits get more at Liberty, and the Blood acquires a greater Degree of Solution, they will be then more vivid in their Motions, and their Excurſions will be copious, quick, and ſudden, and conſequently will they more frequently diſtil into the Interſtices of the Muſcles, whereby the Pulſe will become more quick: But if all theſe Requiſites to Contraction happen to be mixed with other Bodies, natural or not, in ſuch Manner that with them the Spirits influence the Muſcles and the Heart in the ſame Meaſure as in a natural State, the Pulſe will then be as ſlow as natural; and if they are of the ſame Energy, and the Quantity of a diſtempered Fluid at that Time flowing through the Veſſels, compounded of a turbid and a limpid, a thin and a viſcid Blood, and conſiſting of unequal Particles, be the ſame as the Quantity of natural Blood, the Pulſe will then be like to one that is natural, in Magnitude, Frequency, and Strength: But on Account of that Inequallity of Mixture in the Fluid thus paſſing the Blood-Veſſels, there will reſult a thouſand Inconveniencies, and ſuch too as are fatal, as we ſhall preſently come to demonſtrate.

quick.

natural.

Suppoſe then the *Lentor* at the Beginning of this Fever to be very great; during that State then very little will flow through the Arteries, whence the Pulſe will be then very ſmall; again, when the Heat is diſengaged, if it is more at Liberty in the Brain, as it really is, and finds not ſo much *Lentor* in the Arteries of the *Pia Mater*, that in Order to its Fermentation its *Impetus* ought to be ſlackened and reſtrained, there will be generated a very ſharp Fluid in the Nerves, and rapidly flowing through them; whence the Heart will frequently contract, and there will enſue a Pulſe both very ſmall and very quick at the ſame Time. And becauſe from ſuch an inconſtant Solution, Motion, and Return of this *Lentor*, it neceſſarily happens, that ſometimes this and ſometimes that Artery is obſtructed, and as the reſt of the Blood is ſometimes more lax, and at others more implicated, it comes about that the Arteries of the *Pia Mater* are now more, and then leſs obſtructed; that is, the Spirits are there generated ſometimes plentifully, at others ſparingly, at others ſharp, and at other Times ſluggiſh; and as the ſame may be likewiſe ſaid concerning the Blood which is to influence the Muſcles, it is plain that on this Account the Pulſe for the moſt Part will be changeable, both as to its Slowneſs, Frequency, Magnitude, and Strength, which are the principal Affections of the Pulſe.

How the Urine.

But as in the firſt Days it may happen, that this *Lentor* may not be enough fuſed, as to depoſite any of its diſtempered Particles by Urine; and as it may happen that the Motion of the Blood may be ſo near to that of a natural State in this very Caſe, as to give a Pulſe like to an healthful one, ſuch a Velocity of this may be given through the Kidneys, as is neceſſary to proportion the Quantity of groſs and fluid Particles with each other, as in a natural Urine; and conſequently alſo that with this undiſſolved *Lentor*, either none or few of the Particles neceſſary to conſtitute a natural Urine may be detained: When therefore theſe Conditions are given, the Urine will be ſecerned like to what is natural, accompanied notwithſtanding at the ſame Time with ſuch diſtempered Symptoms, as are the neceſſary Reſult of a Blood thus compounded of very thin and very viſcid Parts. But if with the *Lentor* is entangled any rigid Particles that would give to the Urine Conſiſtence, Colour, and Sediment, or the Velocity of the Blood is ſo great, that nothing but its moſt liquid Parts can be ſeparated in the

Kidneys, then of Neceſſity the Urine will be made thin and crude; and as it contains nothing that can fall to the Bottom, it will be without Sediment: But if this *Lentor* be in ſome Meaſure diſſolved, ſo that moſt Parts of the Blood have a Mixture of it, ſomewhat more groſs may chance to be ſeparated, becauſe the whole is reduced almoſt to equal Fluxility, ſo that the thicker Particles will find but little Obſtruction, by Means of ſuch an acquired Fluxility, and be ſeparated with the Urine; but this is not like to that from whence a natural Sediment is produced, howſoever it may appear as a Sediment, becauſe it falls to the Bottom of the Urinal, and is ſo very much unlike it, as to appear more like Excrement. This may alſo happen when there is not ſo great a Corruption of the Blood; but when its Velocity is ſuch, as will admit of the Separation of this groſs Matter through the Kidneys: And for the ſame Reaſon, when the like Circumſtances and Conditions are given, will there be a Urine made that is thick, coloured, and turbid, with a thick, coloured, and turbid Sediment.

The Heat mild at firſt.

But becauſe the more diſengaged the Heat is, the more ſharp it will be; in this Conſtitution of Blood, by Means of its ſuſed *Lentor*, ſome of its more viſcid and thick Parts will be continually joined with it; tho' in a *Cauſus*, the Heat is altogether free of ſuch Mixture; and in a *malignant* Fever, notwithſtanding the Heat is very intenſe, yet becauſe it is implicated and reſtrained by the viſcid Particles of a diſſolved *Lentor*, in Compariſon to that of a *Cauſus*, it will be leſs than that, which is very intenſe by its Nakedneſs, and the Loſs of all the igneous Particles: Yet becauſe the Conſtitution of the Blood in this Caſe is much worſe than in a *Cauſus*, although its Heat is comparatively leſs, there will be joined therewith more grievous Symptoms than in a *Cauſus*; and the ſame Meaſure of Heat will be apparent in thoſe who are not ſenſible of ſuch a Deviation from a natural State.

Thirſt how, &c. Becauſe the Thirſt ariſes from a Defect of Spittle, and a due Moiſture to ſoften the Membranes, and both theſe are deficient, either from a drying Heat, or ſome Obſtruction hindering their Influx into the Mouth, or from ſome Viſcidity reſtraining the humid Parts, and preventing their Separation in ſuch a certain Meaſure of Compreſſion; if therefore the Heat ſhould be more remiſs, that is, very little drying, as often as there ſhall be given a Viſcidity that ſhall reſtrain it, or an Obſtruction that ſhall hinder its Paſſage to the ſalival Glands, or any other Veſſel from whence ſuch Humour is derived, or both, there will enſue a Thirſt, and that about the Mouth only, or to the whole Body beſides, without an Intenſion of Heat; but as in the ſuppoſed Conſtitution of Blood there is a *Lentor* given, from which may ariſe Obſtruction, or Implication of Humidity, or both, it appears that in a *malignant* Fever there may be given a Thirſt much greater comparatively than the Heat.

Yet it may alſo happen, that no Thirſt ſhall attend this Fever even when the Heat is intenſe, and the Tongue dry; that is, as often as the Blood is ſo broke in its Texture, that the Heat is felt ſharper than ordinary, by the Abundance of its Quantity and Liberty, but that it is attended at the ſame Time with ſomewhat moiſt, that is, too difficult for the Heat to attenuate to the Degree of Evaporation; for from hence the Parts will in ſome Meaſure be ſoftned, although the Tongue it ſelf is dry at the ſame Time, by the Steams of hot Particles continually riſing from the *Abdomen* through the *OEſophagus*, and the Lungs through the *Trachæa*, the *OEſophagus* it ſelf yet remaining with ſome Meaſure of Humidity; and that this Dryneſs upon the Tongue is only ſuperficial, is manifeſt from the Power of Speech; for without the Motion of its Muſcles, and the Preſervation of their due Moiſtures, that Faculty could not be exerted. But although this Kind of Fuſion in the Blood does not happen, and the Dryneſs of the Tongue is not only ſuperficial, but deeper; nay, ſuppoſe it extended to the whole Body, and a parching Dryneſs was upon every Membrane; it might even then happen that no Thirſt ſhould be felt; becauſe by ſuch extreme Drought, the Nerves are ſo parched, that their oppoſite Sides fall into Contact with one another, and in ſome Meaſure cohere, inſomuch that the whole Nerve is ſtiff, ſo that neither a Senſe of Thirſt, nor of any Thing elſe, can be perceived by it; that is, where ſuch Dryneſs is in the higheſt Degree, and protracted; or when the Heat hath conſumed all the Moiſture; or becauſe the *Lentor* hath obſtructed the Canals, whereby the Moiſture cannot flow into the Interſtices of the Membranes.

Inappetency, &c. But becauſe by Means of ſuch a depraved Conſtitution of Blood, bad Humours are generated, and derived from it into the Cavity of the Stomach, which there prove irkſome, when they move along its Coats; when therefore any Thing whatſoever is offered to be taken in, we naturally fall into a Loathing thereof, from an Expectation and Fear of its occaſioning the ſame irkſome Perception as is felt by diſturbing and putting into Motion the diſtempered Matter therein already ſecerned from the Blood; nay, we not only fall into a Loathing, but a remarkable Averſion, ſo conſiderable, as to excite from it ſelf a Perception of Uneaſineſs at Stomach, whereby it will be drawn into Vomitings, and contract ſo as in Reality to give Motion to thoſe contained Humours, and excite great Diſorders. But this Nauſeouſneſs and Vomiting is manifeſt from the *Twenty firſt Propoſition*, and from what hath been ſaid concerning a Loathing of Food of any Kind, and from what Cauſe ſoever.

Frequent Shakings.

The frequent Shakings which recurr without any Manner of Regularity or Certainty, often in one Day, may eaſily be underſtood from what hath been ſaid concerning a *Lentor* with Cold, and from the Nature of the Blood, which is here ſuppoſed to be viſcid in ſuch Manner, that as often as it accumulates in the Arteries, ſufficiently to obſtruct the Exertion of Heat, there cannot but ariſe a Senſe of Cold.

The Weight of the Body.

From this very Viſcidity of the Blood proceeds the Weight that is felt all over the Body, and as it were a Contraction on of the Parts together, as it appears from the Explanation of that Cold, as produces a Pain even in the Bones, as if they were breaking; and this Senſation will be by ſo much the greater, as the Quantity of Spirits, by Means of ſuch Viſcidity in the Blood, and Exhalation of Heat, is generated leſs than uſual; which Spirits, in their natural Vigour, by ſtrong Contractions of the Muſcles, are able to overcome the Weight of ſuch obſtructing Viſcidities.

Delirium.

The *Deliria*, which are poſſible to happen in this Conſtitution of Blood, are knowable from the *Twenty firſt Propoſition*, and from the Doctrine of *Deliria* in general; becauſe therefore there is here ſuch a Diverſity in the compounding Particles of the Blood, the *Lentor*, or other Humours, will flow on or ſtop, but not altogether without Pricking and Tenſion, from the *Impetus* of the igneous Particles; and this will be diverſified without any Certainty, according to the Conditions of Motion or Obſtruction in the Arteries of this or that Part; and hence wandering Pains will ariſe, here or there, and of longer or ſhorter Duration.

Sweats, &c.

Sweats will frequently enſue from the Solution of ſuch Parts as are able to break through in that Manner, and they will be ſhort and little, either becauſe

cauſe the Heat, which makes this Solution, exhales a great deal of Moiſture inſenſibly, or becauſe the *Lentor* ſo entangles both the ſaline and aqueous Particles, that they cannot be diſengaged and ſeparated by the Compreſſive Power in Being: Hence alſo they are of no good Effect, becauſe ſuch Sweats are not from the Expreſſion and Expulſion of a noxious *Lentor*, but ſomething ſeparated from it, that leaves it yet more injurious to the Conſtitution, while all its Humidity is hereby drawn off from it: Theſe Sweats may often happen at the Beginning of the Diſeaſe, and when the Solution of the Humours firſt takes Place; but on this Head enough hath been already ſaid above, whence all that belongs thereunto may be underſtood.

Redneſs of the Eyes.

But here alſo may frequently happen redneſs of the Eyes; for as the Blood is conſidered as a Vehicle compoſed of groſs and fluid Parts, whenſoever any of the groſſer Parts obſtruct in the Arteries running through the White of the Eye, ſo as to hinder the Flux of what is more fluid, it will, by the Motion of its igneous Particles, and the continual Afflux of circulating Blood, diſtract and thruſt outwards the ſame Arteries; and in all thoſe Parts that are open to the Sight, diſcover a

Redneſs; and it will the more frequently happen thus in this Circumſtance; becauſe the Blood in ſuch a Conſtitution is more apt to give ſuch a Colour.

Spots, &c. Further, in this Diſtemperature of Blood, where it is both thick and thin at the ſame Time, it is manifeſtly diſpoſed to produce Spots and Puſtules all over the Body, by the Demonſtration in *Propoſition* XXI. and that thoſe Spots and Puſtules may be of any Magnitude and Colour, as livid, black, green, and any others of a worſe Hue if poſſible, and of a worſe kind; for in the Conſtitution of Blood, here ſuppoſed, there is a continual Fermentation, and Solution, from whence, as ſome Portion of it is derived, by Means deſcribed in that *Propopoſition*, to Parts that are tranſpirable, and leaves others more groſs behind; which, as it is fermentable, before it can ſeparate or perſpire, muſt make Spots and Puſtules, greater or leſſer, as the obſtructed Matter fills greater or leſſer Space; and they will be differently coloured, according to the Diverſity of the obſtructed Matter, the worſt kind of which will be black, dusky, green, or livid; at the ſame Time giving Indications of the Groſſneſs and fixed Nature of their compounding Particles; but this however may not conſtantly prove ſo.

But becauſe that which is reſolved into perſpirable Matter, or fermented into Suppuration, is then ſomewhat eaſily diſpoſed to Fluxility, and Expreſſion, ſince both of theſe Circumſtances are derivable from that Diſpoſition; therefore that Matter which ferments as ſoon almoſt as it comes to lodge, either remains upon the Part, or is reſolvable by Perſpiration; and where it is derived to Parts of the Body, where the Skin is thin, but ſubjected to frequent and vigorous Motion, it will not accumulate, but perſpire as faſt almoſt as it collects, even although it ouzes through the Veſſels, and extravaſates: Thus the *Small-Pox* and Eruptions of like Kind come to Suppuration, and remain, but the Meaſles are diſſipated by Perſpiration before they ſuppurate. Therefore all Puſtules and Eruptions of this Nature, as they conſiſt of Matter eaſily reducible to Fluxility, they cannot break into Parts of great and continual Motion, and where the Skin is thin, as upon the Back and Breaſt; but in the Hands, Feet, and Face, that is, Parts that are endewed with a hard, thick Skin, and have but little Motion: If therefore upon the Breaſt and Back be accumulated Matter, that would otherwiſe generate Puſtules, that which is its thinneſt Part will be ſpent in Vapour, or Perſpiration, while the thicker Part remains behind in the Skin, or the Cuticle, or between both, without raiſing any Tumour, but giving ſome Colour thereto; whence there will ariſe Spots, though no Puſtules, like what we call Flea-Bites, or bigger; and theſe will cover the Back, Breaſt, or any other Part of like Conformation. From hence alſo it appears, how even Puſtules may happen upon the Back or Breaſt, and Spots in any other Parts of the Body, according to the different Degrees of Perſpirability in the Matter generating them.

Redneſs in the Face.

From this ſame Diverſity in the compounding Particles of the Blood, it likewiſe happens that the Face may be more florid and lively, when the Blood paſſes through the Veſſels there, like what is natural, and does not obſtruct them, with a *Lentor*, ſo as to prevent the Influx of Spirits for the Invigoration of the Eyes, and other Parts; and at another Time like the Countenance of a dead Perſon, when both the Motion of the Blood, and the Spirits in the Nerves, are determined in a very different Manner; but even at the Point of Death the Face may ſeem florid and lively, although juſt before it looked never ſo ghaſtly; that is, when the natural Strength is ſo far ſpent, that the thickeſt Part of the Blood begins to ſtagnate in the Capillaries of the whole Body beſides, the thinner Parts, and that which recedes leaſt from its natural State, yet continuing to flow through the Veſſels in the Face.

Bleeding at Noſe.

Hence follows likewiſe a Dropping of Blood from the Noſtrils, eſpecially in the Beginning of the Diſeaſe, either from a *Lentor* obſtinately obſtructing the Veſſels, and forcing the Blood to crowd through the Coats of the Arteries, where they are weakeſt, or from the *Impetus* or Activity of the more thin Parts occaſioning the ſame Rupture, or from both Cauſes conjointly; and this Eruption of Blood will be different in Quantity, as the Energy of Heat and Obſtruction is different, that is greater or leſſer.

Worms, &c.

Further, From this extraordinary Perturbation of Blood, and Exiſtence of diſtempered Humours, it comes about that the Seeds of Worms are hatched; and if theſe come to their Growth in the Inteſtines or Stomach, they are capable of Expulſion either by Stool, or upwards by the Mouth or Noſe, as the Paſſage from the Throat to the Noſtrils is kept open by the *Vomer*; but they may be alſo generated in the ſalival Glands themſelves; for it appears that Worms are often obſerved to breed in ſuch Parts.

But all other Affections, which are generally aſcribed to *malignant* Fevers, may be underſtood from the *Twenty firſt Propoſition*, or from particular Diſeaſes; ſuch as are Sleep; a Lethargy; Watching; Loſs of Memory; various Appearances; frightful Dreams; Confuſion; Swimming; Trembling; Convulſions; Inquietude; Anxiety; Dimneſs of Sight; Deafneſs, and Ringing in the Ears; Loſs of Smell and Taſt; Heart-Burn, and an unquenchable Thirſt; Nauſeouſneſs; looſe and fetid Stools; Swellings in the Neck and Groin, of Difficulty to cure, and which very often go in again; the Tongue dry, rough, and black; the Mouth bitter; and the Extremities changing ſuddenly from cold to hot.

Conſequences. But, laſtly, becauſe by this Kind of Fermentation, and Change of Blood into Humours that are not natural, ſomewhat may be generated that ſhall exhale in Steam from the Body, that is capable of inſinuating into the cutaneous Pores of other Perſons, and reducing the Blood of ſuch into the ſame State of *Lentor* and Fluidity, that is, both too thin in ſome Parts, and too thick in others; if therefore a

Change is made of this Kind, and arrives to this Degree in any one Patient, all other Perſons near the Sick may fall into the ſame Diſeaſe, by the Inſinuation of morbid Steams into their Pores, which ſhall alter the Craſis of their Blood, and produce the ſame Affections; and becauſe when the Blood is arrived to this Degree of Diſtemperature, it will be very difficult to bring it back into a natural State, on which Account not only moſt who are ſeized with this Diſtemper die, but that which was ſingle before, or affected but one Perſon, ſpreads alſo to others, becomes popular, and deadly; that is, in ſhort, a *malignant* Fever very eaſily brings on a *Peſtilence*. Wherefore the whole *Propoſition* appears true; and as all theſe Affections depend upon this *Lentor*, and a Blood thus vitiated, it is manifeſt that the immediate Cauſe of a *malignant* Fever, is the ſame as above explained, and that it hath its neceſſary Dependance on a vitiated State of Blood, as to its Qualities.

A *malignant* Fever therefore is a Fault in the Blood's Qualities, whereby, from a certain *Lentor* capable of various Degrees of Fluxility and Fermentation, ſometimes this, and at others that Part is obſtructed, as appears from the Courſe of the foregoing Demonſtrations.

PROPOSITION XXVIII.

The Antecedents *to a* peſtilential *Fever may vitiate the Blood in its Motion, Quantity, or Quality: But its* Concomitants *and* Conſequences *do neceſſarily depend upon its vitiated Qualities: And what is a* Peſtilence.

Antecedents, *how they operate.*

As all the *Antecedents* to a peſtilential Fever agree in vitiating the Blood, the *Propoſition* would ſtand demonſtrated without any further Explanation: For although they vitiate the Spirits themſelves immediately in Quality or Quantity, by a Mixture of Viſcidities, or Humours that ſhall ferment more briskly than natural, the ſame Cauſes will alſo for the ſame Reaſons vitiate the Blood in its Quantity; although even theſe very Faults in the Blood's Quantity and Motion, are neceſſary Attendants upon, and Conſequences of the Blood's Fault in Quality; and therefore we muſt here conclude, as above explained, concerning other Kinds of Fevers.

Yet moreover this Affair is in it ſelf ſo plain, that no one can doubt whether in a *peſtilential* Fever the Blood is changed in its Qualities; for whether this Change is aſcribed to a Poiſon, or any occult Cauſe, it is taken for granted by all, that the Blood muſt be altered from its natural Qualities, and it ſtands already demonſtrated ſo to be in the foregoing *Propoſitions*; and what ſtill ſtrengthens this Matter is, that the *malignant* Fevers juſt now deſcribed, whoſe very Eſſence conſiſts in this State of Corruption, wherein the Blood is too thick and too thin at the ſame Time, are amongſt the *Antecedents* to this of a *Peſtilence*. Moreover, the Eruption of the *Small-Pox* and *Meaſles*, not only upon Infants, but adult Perſons, and alſo the frequent Appearance of Carbuncles, Buboes, Boils, *&c.* do manifeſtly indicate that ſome Part of the Blood is rendred too compact and adhæſive, while other Parts are too much fuſed and liquid, and exerting too much *Impetus*; and that by the Accumulation of ſuch upon particular Parts, are generated moſt untoward Swellings, tending to Fermentation, Cold, or Heat, as hath been ſhewn in the *Twenty firſt Propoſition*, and others Antecedent to that. And from that Eruption particularly termed an *Anthrax*, may be drawn an irrefragable Argument, that the Quality of Blood is vitiated in a very extraordinary Manner; for that is a Swelling extreamly hot, and therefore there muſt neceſſarily be collected upon that Part ſomething groſs, that by the *Impetus* of an intenſe Heat acting upon it, becomes at length broke, and excites all round it a burning and ſcalding Heat.

Why fatal to moſt.

And therefore in a *Peſtilence* we ſuppoſe the Blood to be conſtituted, and changed after the ſame Manner as in a *Malignity*, but that a *Peſtilence* is the higheſt Degree of Malignity; and as a *malignant* Fever may be diverſified, as the Blood is differently coagulated or fuſed, ſo likewiſe a *Peſtilence* may be varied proportionably to the Diverſities of the ſame Circumſtances, to which alſo may be added, that in the latter moſt die who are ſeized with it; and which cannot be at all difficult to conceive of, when the Diſtemperature of Blood is in this Caſe arrived to ſo great a Height, that all the Power of Art cannot reſtore it to its natural Conſtitution; or for Want of a more thorough Inſight into the Nature of this Coagulation and Fuſion.

Further, As this Coagulation and Fuſion may go on ſo far, as to ſet at Liberty, and perſpire through the Surface of the Body, or with the Breath in Reſpiration, many noxious Particles, which may be ſo ſubtle and active, as to enter the cutaneous Pores of other Perſons, or mix with that Air which they draw, in Reſpiration, and when got into the Body, be able to make the ſame Change in the Blood, both as to its Coagulation and Fuſion; hence it comes that ſuch a Fever proves contagious, which is an inſeparable Requiſite to a *peſtilential* Fever.

The Contagion *manifold.*

But this is not only thus brought about; but alſo the diſſolved, and diſperſed Particles may longer adhere to ſome inanimate Bodies than others, as to woollen and linen Cloaths, Papers, *&c.* and theſe Particles may, by the Steam of a living Body, or by the Means of any other Heat, be put into Motion, ſo as to breath out of thoſe Lodgements, where they quietly reſided, and obtain ſo much Liberty, and Action on all ſides, as will carry them into the cutaneous Pores of any Perſons within their Reach, and infect them; and on this Account a *Peſtilence* may be brought from very diſtant Countries, lying a long Time in ſuch Manner concealed, and then ſuddenly breaking out; with many other Circumſtances of like Nature.

But if theſe ſubtile and active Particles be of that Nature, that they can penetrate the Pores of other Animals, and occaſion a like Coagulation of their Blood, not only Men, but Brutes alſo, will be ſeized with a *Peſtilence*; but this does not always very neceſſarily happen, becauſe the Blood of Animals is different from humane Blood, ſo that although theſe Particles are ſuppoſed to get into it, it does not therefore neceſſarily follow that they muſt vitiate it, any more than will *Aqua Regia* diſſolve all kinds of Metals; but yet Brutes of all kinds, or ſome of them only, will be ſeized equally with Men, when this ſubtile and active Ferment, which penetrates the Surface, is of that Nature, as will taint the Blood of thoſe Animals with thoſe *peſtilential* Requiſites.

As this kind of Contagion then can eaſily proceed from an infected Perſon at a great Diſtance, as often as the noxious Particles can reach another Perſon, and give that Degree of Coagulation and Fuſion, as is neceſſary to a *Peſtilence*; the more aggravated then will be this Calamity, and more eaſily ſpread, when a healthful Perſon is near to one already infected; and yet much more worſe, if it is in Contact with thoſe Parts, which more plentifully, and with a greater *Impetus*, breath out infected Steams, as is the Air ariſing from the Mouth and Lungs, which muſt be extreamly hot; or the Perſpiration of a Carbuncle when it is greatly inflamed; for in this Caſe the exhaling Particles will be in their greateſt Activity when neareſt the recipient Body, and likewiſe more denſe, that is, more numerous, and conſequently of greateſt Efficacy.

But it is not every one that is ſeized with a *Peſtilence* from Contagion, by Means of Steams exhaling from any particular Parts of the Body; but only when theſe Steams, and the Air it ſelf, hath joined with, and interſperſed through it Particles of vitiated Faculties; and then this Kind of Fever will eaſily be communicated, and neceſſarily enſue, not only on Account of what gets into the Body with inſpired Air, but becauſe alſo the whole Body is ſurrounded with ſuch an Infection, wherein the noxious Particles floating about on all Sides, will endeavour to penetrate through the Pores upon the Surface, and get that Way into the Blood; for although the Skin is thicker upon the Surface of the Body, than that Pellicle covering the Veſſels in the Lungs, and for that Reaſon it requires longer Time for ſuch Particles to get that Way into the Blood, and the Habit of the Body, yet it is no Argument that they cannot get that Way at all, and be admitted into the Juices.

Why popular, *and when.*

But from whichſoever of theſe Cauſes a Contagion happens, this Fever will eaſily become *popular*; and ſometimes neceſſarily, when ſuch a Contagion does not derive its Origin from Particles mixed with the Air, but exhaling from ſome particular Body; for then it cannot communicate this Fever but to thoſe who are near the infected Perſon, or placed at a Diſtance, wherein the exhaling Particles are not ſo ſcattered as to loſe their Efficacy, for that will be the Caſe when they are much diſperſed: But becauſe at the Beginning of theſe Fevers which are *peſtilential*, there is but little Diſtruſt of Danger, inſomuch that Perſons freely converſe with the Sick, ſo that they receive the Tamit into their own Conſtitutions, whereby themſelves become infected, and communicate it likewiſe in the ſame Manner to others.

But then from the Number of infected Perſons, many noxious Steams will gather in the Air; ſo that although what exhales from any ſingle Perſon may be ſo diſperſed at a certain Diſtance enough to loſe its Efficacy, yet that very Space ſhall be reached by Steams riſing from many ſick Perſons at once, ſo that in every Point there will be collected a ſufficient Quantity to infect all Perſons drawing ſuch Air, or expoſed to its Inſinuation through the Pores, with a *Peſtilence.*

When Things are then brought to this paſs, a *peſtilential* Fever muſt neceſſarily ſpread, and become *popular*; but further alſo it will be made ſo when the Air is impregnated with the like Sort of Particles, not only breathing out from the Bodies of diſtempered Perſons, but likewiſe from either putrid Carkaſſes, or Pits, or ſubterraneous Caverns, or from the Conveyance of Winds, or generated by unwholſome Blaſts, or Changes of Seaſons, with many other Cauſes of like Nature. But if before the Air is infected, it be known that there is a ſick Perſon, or any Thing elſe that may ſpread a *Peſtilence*, that is, a Fever communicable by Contact, and fatal to moſt; and if Care be taken that ſuch Perſon is kept private till he dies, or recovers, or if whatſoever other communicating Cauſe be ſtopped in its Progreſs, then a Contagion will be prevented, and its Infection of the Populace; but under this Care, a ſick Perſon is not to be ſaid free of a *peſtilential* Fever, becauſe it does not ſpread amongſt the People; for the Reaſon of its not ſpreading, is the Conſequence only of Care to reſtrain it, and whereby it cannot communicate its Contagion; for if it had ſuch Liberty of Communication, it would ſpread, and become *popular*.

All other Concomitants.

As for all other *Concomitants* of a *peſtilential* Fever, they may be very eaſily and plainly underſtood, partly from the Nature of a *malignant* Fever, partly from the *Twenty firſt Propoſition*, and partly from particular Diſeaſes: And in this ſuppoſed Conſtitution of Blood, where it is both too thick and too thin, both a great deal of Spirit will evaporate, and a great deal will be entangled in the *Coagulum* or *Lentor*, whence cannot but enſue a ſudden and great Decay of Strength, without any Perturbation of Mind, ſo that there be but enough Spirit left to actuate the Parts aſſiſting in Cogitation; but the Mind will alſo be diſordered when there is not ſuch a Sufficiency of Spirits left; and this Sufficiency will happen both when the Quantity waſted is not extraordinary, nor its Qualities much hurt; which laſt may be often the Caſe in the Brain, by Means of the innumerable Occurſions of the Blood againſt the *Plexus's* of the *Pia Mater*, whereby it is more perfectly elaborated than in any other Parts of the Body: And for the ſame Reaſons may the digeſtive Powers be not ſo much perverted, as a Humour is generated more diſpoſed to Concoction.

But this ſudden Decay of Strength will be without any manifeſt Cauſe, as it depends upon an inward Concretion, and Fuſion of Blood; the Patient will be reſtleſs, and toſs about in Bed to ſeek a cool Place; the Heart will palpitate; and a Fainting and Syncope will enſue, as explained in our Account of *particular Diſeaſes*. The Differences of Pulſes may be underſtood from the foregoing *Propoſitions*. A great and burning Heat internally, while it is externally mild, or none at all, inſomuch that the Hands, Feet, Noſe, and Ears, ſhall be quite cold, happens; becauſe whatſoever is moſt viſcid in the Blood, will lodge in the capillary Arteries of the extream Parts, while the more liquid and fuſed Parts circulate inwardly, and excite a Perception of intenſe Heat, ſo that the Patient to his own Appearance will be extreamly hot, and through Impatience throw off all Cloaths and Covering.

What we have here inſiſted upon, are the much more conſiderable of all the *Concomitants* which remain to be explained, every one of which are eaſie to be underſtood from what hath been already ſaid; and it may further be collected from what hath been ſaid concerning *particular Diſeaſes*, what muſt be the Effects of a Blood unequally fluid, and compounded of Parts both more groſs, and more fluid than natural. And why Death in this Caſe does alſo enſue, is as manifeſt; after which Spots break out, like to thoſe who have been taken off by violent Poiſon, becauſe they are the Stagnations of the thicker Parts of Blood between the Membranes, whilſt the thinner evaporate for Want of ſufficient Cohæſion between the Blood's compounding Particles; and this Difference and Loſs of Cohæſion is the known Effect of Poiſons, which kill by throwing the Blood into Fermentation; and therefore is the whole *Propoſition* demonſtrated.

A *peſtilential* Fever therefore is a Fault in the Quality of the Blood, whereby there is a *Lentor* generated capable of ſuch Motion and Fermentation, as will break it into perſpirable Parts, which will inſinuate into the Blood of other Creatures, and infect it after the ſame Manner, and of which Infection do moſt Perſons die.

PROPOSITION XXIX.

Of Symptomatical, *and* Secondary *Fevers.*

The *Phlegmonodes*, *Eryſipelatodes*, and *Typhodes*, which are termed Fevers, and are ſuppoſed to ariſe from true or ſpurious Inflammations, may be underſtood from particular Diſeaſes, from the Manner of producing Inflammations, and from the Doctrine of Fevers hitherto explained; and the whole Matter is reduced to this, that whenſoever there happens a conſiderable Tumour, all thoſe Parts of the Blood that are more groſs than natural will lodge therein, while thoſe Parts which are thinner, and conſequently of greater Activity and *Moment*, will continue in Circulation, through all other Parts of the Body; from whence there muſt ariſe a great and continual Heat, becauſe only the more fuſed and hot Parts of the Blood is kept in ſuch Circulation. Sudden Chillineſſes will alſo happen, which will as ſuddenly diſappear, or remain for ſome little Space of Time, according as by ſuch Inflammation ſome Part of the obſtructed Viſcidity, which is able to entangle the Heat for ſome Time, is broke away, and carried along in the Current to its Relodgment in the Capillaries. Nay, a continual Coldneſs may happen upon the extreme Parts, when the Blood which keeps on its Motion through the Arteries is reduced to ſo ſmall a Quantity, as to receive an *Impetus* from the Heart, but very inconſiderable in Compariſon to that which is otherwiſe required to waſh out that *Lentor* from the capillary Arteries that obſtructs them, and implicates the Heat from Action. The ſame Affection will likewiſe occur, whenſoever the thinneſt Parts of the Blood are mixed alſo with groſs ones; for when theſe are arrived at the Capillaries, they will receive but very little *Impetus* from their Contractions, from whence they muſt ſtop; and if there they entangle the igneous Particles, a Cold will enſue without Remiſſion, and continual, according as ſuch Obſtruction ſhall ſooner or later, or never be removed; and they will always be acted upon by a leſſer *Impetus*, when even the thinner Blood is retarded in its Motion.

A Lypiria.

A *Lypiria* may be underſtood by the Explanation of an *Epiala* in the *Twenty third Propoſition*; nor is it neceſſary that it ſhould have any other internal Inflammation for its Origin; the Blood, it is certain, may freely flow through the internal Arteries, without any Stop, as there always is in an Inflammation, whether it be with a large Tumour, which is called *Syſtrophica*, or without any ſenſible Swelling, when it is called a *Phlogoſis*, or an *Eryſipelas.* But a *Lypiria* will neceſſarily happen, whenſoever the capillary Arteries in the extream Parts, and thoſe eſpecially which are external, are obſtructed in ſuch Manner, that by neither the Force of the Blood, and the inteſtine Motion of the obſtructed Particles, ſuch Stop can be removed; for the Blood in this Caſe will have ſuch a Compoſition of Parts that are groſs and viſcid, and adhering to the external Capillaries, and of ſuch as are thin and fluid, that although the former obſtruct not ſufficiently to raiſe a Tumour, or any Stop from Inflammation,

mation, yet there will be a great and a burning Heat inwardly, at the ſame Time that the external Parts are cold. The Pulſe at this Time will be ſmall by a Poverty of Blood, and quick by Reaſon of its Thinneſs and Activity, and the ſmall *Impetus* with which it circulates will make the Pulſe alſo a very ſhort Time perceivable to the Touch; it will be unequal, and ſuch Inequallity determined by the greater or leſſer Quantity of Blood, or Spirits, and the ſtated or interrupted Times of the Auricles and Heart's Contractions.

A Lenta. A *Lenta* or *Slow* Fever may proceed from any Cauſes commonly aſſigned, and in general from a Blood ſlightly vitiated, ſo that its Fault be permanent, or that the Cauſe firſt vitiating it may continue in Exertion; whether another Cauſe of like Kind immediately ſucceeds upon another Termination, either from Obſtruction, or Putrifaction, or a Corruption of any of the *Viſcera*, or from any other Origin of like Nature: The Fever cannot but be determined in its Affections and Height, according to the Nature and Efficacy of the vitiating Cauſe; when this therefore is ſlight, that will be ſo too, from whence it is poſſible to be ſo favourably taken with this Fever, as hardly to know whether a Perſon ails with it or not: But yet the Tokens of this Fever are manifeſt in the Pulſe and Urine, both of which will deviate from a natural State in many Circumſtances, as already abundantly appears from what hath been ſaid above concerning other Fevers. The Patient will manifeſtly grow weak, although the generating Cauſe is but ſlight, yet ſo far able to vitiate the Blood, that by its Heat and *Impetus*, ſomewhat is continually waſted, inſomuch that the Patient is not proportionably recruited by Food; but hereby a Perſon may be more or leſs recruited, or ſeemingly not at all, as the Cauſe of the Diſtemper may be in this or that *Viſcus*, that is, of greater or leſſer Importance in the Elaboration of Nouriſhment, as in the Stomach, Meſentery, Liver, or in the Blood it ſelf, from whence either the Juices conducing to Concoction may be derived in a diſtempered State, or if they are not ſo derived from it, the Chyle may be vitiated when it is paſſed into a vitiated Blood. A Patient then thus defrauded of Nouriſhment muſt grow lean, and waſte by the Attrition of the vital Actions only, ſo that according to the Diverſity of the Fever, and the natural Conſtitution of the Patient, which is not reducible to any certain Standard, may he continue in this Condition 40 Days or longer.

The White *Fever.* Like unto this, both as to its Affections and Origin, is the *white* Fever of Virgins affected with a *Cloroſis*, and the Fevers of *Cachectick* Perſons; the former of which is from a Diſtemperature of the genital Parts, and the latter from Cauſes not much differing from thoſe of a *Lenta*, which therefore want not any further Explanation here.

Symptomatick *Fevers, from a Corruption of Milk, or* There are alſo other *ſymptomatick* Fevers, from a Corruption of Milk in the Stomachs of young Children and Infants, whence are generated viſcid Humours, and a viſcid Blood, diſpoſed for the Production of Fevers; and as this Cauſe firſt ſubſiſts in the Stomach, many other Diſorders may be occaſioned, that by Conſent of Parts will give various Appearances, and cauſe crying, grating the Teeth, Convulſions, and many other Symptoms of like Nature, which may be eaſily followed by Death in ſuch tender Bodies. Others arise from Crudity, which are like this in Children and Infants, in

Crudity.

like Manner from Viſcidities in their Stomachs, that is, when too much Food is crowded in at a Time, or that is not ſufficiently comminuted by Maſtication, for Want of Teeth at ſuch an Age to perform it. Others again from a Derivation and Corruption of Blood out of the Veſſels, as in Tumours and Bruiſes, *&c.* partly from the Pain, and partly from the Matter, which, when mixed with the Blood, will produce all the ſubſequent Affections, as it appears from the Nature of Inflammations, and of Fevers, as above explained. *Extravaſated Blood.*

Worms. But there is yet ſomewhat more extraordinary in the Fever which ariſes from Worms, which therefore it is worth our while to be ſomewhat more particular about. Becauſe then Worms are not naturally bred in the Stomach and Bowels, as often therefore as ſuch Animals happen to be there produced, there muſt neceſſarily be ſomewhat more than natural in them, which is either the generating Matter of the Worms brought thither with the Food, or what is contained in, or derived into the Stomach and Inteſtines, is in ſuch a diſtempered State as will change into ſuch a Matter, able to produce Worms.

If the generating Matter is derived from without the Body, at the firſt Production of a Worm there will be but little Inconveniency perceived, for there will then be neither any Fault in the Blood, or other Humours; but preſently the Worm will begin to move it ſelf, it will feed, and depoſite its Excrements; for from the Anatomy of this Creature it is manifeſt all this muſt happen, they being furniſhed with Inteſtines, with Fæces, with a Mouth, and an Anus; from the Chyle then they will conſume ſomething, which may be of ſuch a Nature as to leave the reſt vitiated, and the Chyle will alſo be more certainly vitiated by a Mixture of the Excrements of the Worms in it; moreover theſe Animals will penetrate the Coats by their biting, or vellicate them by their creeping and ſticking to them: And from this Perception alone will Diſorders enſue of the whole Body; and firſt of all from this Senſation of Pain will there be occaſioned manifold Refluxes of the Spirits without any Regularity or natural Order, from whence will ariſe *Deliria*; Diſorders of the Imagination and Memory; Depravations of Sight, and Hearing; Watchings; grating the Teeth; Sucking

ing the Lips; Vomiting; Crying in an unuſual Manner, from the unnatural Motions made upon the Muſcles of theſe Parts; hence alſo Peeviſhneſs, Reſtleſneſs, *&c.* from uneaſie Senſations, and unnatural Refluxes of the Spirits in the Muſcles, and more or leſs as thoſe Cauſes are more or leſs aggravated.

And as by this Kind of Reflux we have already accounted for a Suppreſſion of the Pulſe, in a *Syncopalis*; from the Conſent of the Stomach, it is manifeſt that from the ſame Cauſe, that is, a Pain from the Eroſion, Adhæſion, and creeping Motion of the Worms, the Pulſe may be rendred ſmall, obſcure, unequal, weak, and deficient, as ſuch Perception is more or leſs ſtrong. But further, becauſe the Motion of the Blood is diminiſhed, in this greater Degree of Viſcidity, it will come about that its more thick Parts will adhere in the Capillaries of the extream Parts, and there produce a Senſe of Cold, ſuch as is felt by Perſons troubled with Worms, either continually or interruptedly. While therefore Worms remain in the Stomach and Bowels, the Blood will ſoon be vitiated by the ſame *Lentor* as produced them; inſomuch that if any Thing can be ſeparated from the Blood by Sweat, that will be rendred Cold by the Coldneſs of the extream Parts; or it may alſo be rendred Cold by the Means before explained, and all thoſe Affections will enſue which have been enumerated to belong to the Excretions, *&c.*

But all theſe Things will much more eaſily happen, if the generated Worms are ſuppoſed by their Feed and Excrements to vitiate the Chyle, or if the Chyle is vitiated before their Production, which is very common, as we are ſubject to breed Worms from eating too much Fleſh, from Gluttony, and a Retention of peccant Humours too long, *&c.* and ſometimes Worms that are very uncommon; when therefore the Chyle is thus vitiated, the Blood will be infected with it, and the more eaſily both from the Conſent of the Stomach, and the Pain the Worms there occaſion, and by ſuch a vitiated Blood a Fever will be excited with all the above enumerated Affections.

Hence will ariſe fetid Steams, ſuch as from Vinegar, or Acidities in the Stomach, and there fermenting; and ſuch Humours will be retained in the Stomach, either becauſe it cannot contract ſtrongly enough to reject them by Means of theſe included Vermin, or becauſe they make ſome Obſtruction to their Ejectment, or becauſe from a vitiated Blood ſuch Humours are continually ſupplied; and hence becauſe theſe acid Vapours are continually aſcending up the *OEſophagus*, to the Top of the Mouth and Noſe, under the *Vomer*, there is continually an Inclination to rub the Noſe, in Order to remove ſuch Vellication and Diſturbance.

The Pulſe will be in Proportion to a diminiſhed Quantity of Blood, joined to its vitiated Qualities, and a Senſe of Pain.

There will be an Inappetency to Food, becauſe that Senſation is not excited in the Stomach, as from Hunger; and a canine Appetite, when either the acid Humour, or ſome Effect of the Worms produce a Senſation in the Stomach, like to that of intenſe Hunger, the Body in the mean Time growing lean, becauſe ſuch depraved Humours cannot nouriſh it.

Great Quantities of Spittle will diſtil out of the Mouth, either becauſe the ſharp Humours in the Blood fuſe it into ſuch phlegmy Humidities, as are fitteſt for Separation by the ſalival Glands; or becauſe ſuch great Quantities of pituitous Humours are contained in the Stomach, that by the continual Compreſſion of the *Abdomen*, *Diaphragm*, and Muſcles of the Stomach, ſome Part of them is thrown up thro' the *OEſophagus* into the Mouth, in the Appearance of Spittle: But that which is very wonderful is, that when even great Quantities of theſe Humours are thus thrown up into the Mouth, a Senſe of Thirſt will be felt, not only in all other Parts of the Body, but about the Mouth it ſelf; that is, as often as the Humours ſo caſt up, or drained into it, are ſubtle, dry, and vellicating. The Lips will be in this Circumſtance dry or moiſt, as the *Saliva*, or any other moiſtening Humour is ſupplied to them, whether by Night, or in the Day-time; but becauſe in the Day-time there is a greater Waſte of Humidities by the Addition of a feveriſh Heat, and by the Tranſpiration, and Steams of ſharp Particles which dry them; whence they are dry in the Day-time, and moiſter in the Night.

Oſcitation, or Yawning, proceeds from Steams penetrating the Muſcles of the Jaws and Mouth, or from Humours obſtructing in their Interſtices; from the ſame Kind of Lodgment alſo, whether it be from the Groſneſs of the Humours, or from a greater Preſſure

ſure upon the Fermentation of acid Humours, and their taking up thereby the more Space, ariſes Drowſineſs: What more remains needs not Explanation.

Symptomatick Fevers therefore are of the ſame Origin and Production, as the foregoing; for they all depend upon a Viſcidity or *Lentor* in the Blood, while other Parts of it are at the ſame Time thinner than natural, or as it is poſſible, even in the Worm-Fever, from a vitiated Motion of the Blood; as from the Irritation of Worms, all thoſe Affections may enſue, which are the known *Concomitants* of ſuch a Fever; *Secundary* Fevers therefore are likewiſe to be comprehended under the ſame *Genus* as the others, and they have nothing in them different from what hath been already enumerated in the foregoing *Propoſition*.

PROPOSITION XXX.

The Antecedents, Concomitants, *and* Conſequences *of the* Small-Pox, *do ſo vitiate the Blood in its Qualities, that from ſuch Diſorder does neceſſarily ariſe a Diſorder alſo in its Motion and Quantity; and what this Fever is.*

Antecedents, *how they operate.*

Becauſe a ſhooting in the Forehead and Temples proceeds from a more vehement *Impetus* of the Blood circulating out of the Arteries into the Veins, not ſuddenly, but retarded by ſome Stops in the Capillaries; therefore ſuch a Pulſe muſt proceed from the Blood increaſed in its Motion, or Quantity, or ſo vitiated in Quality, that a *Lentor* is produced which adheres in the Arteries and obſtructs them. When therefore ſuch a Pain as this comes without any previous Indiſpoſition of the Body, or Paſſions of the Mind, which can augment the Motion of the Blood without any Fault in its Qualities; and nothing does precede, which can in like Manner increaſe the Blood's Quantity, but ſuddenly a Fever ariſes which breaks out into Erruptions, that conclude ſome Agitation and Change in the Blood; ſuch a ſhooting Pain therefore does not come from an Augmentation of the Blood's Motion or Quantity, but from ſome *Lentor* obſtructing its Courſe of Circulation, or from Rarefaction and Heat, which is equally an Impediment to its Progreſs in the Veſſels, or from both together; or, which is the ſame thing, from ſome Fermentation of the Blood, whereby its thinner Parts are ſeparated from its more groſs, ſo that the more one rarefies, the more the other obſtructs. From both theſe Cauſes will enſue great Dozineſs; for the more liquid Parts make Compreſſion by their Rarefaction, and the more groſs lodge in the Capillaries; by both which the Brain is ſo much compreſſed, that few or no Spirits can be generated and ſeparated, from whence will appear a Reſemblance to ſleep. Hence alſo frightful Sleeps will happen; for the more liquid Parts of the Blood, which are at greateſt Liberty to Motion, will increaſe in their *Momenta*, and as they fall into this or that Species excitable by ſuch greater

Momenta, as frightful Appearances, ſuch will be raiſed, and conſequently the Sleep render'd diſturbed and frightful.

From the ſame Origin will proceed *Deliria*; that is, whenſoever the fuſed Part of the Blood exerts it ſelf with too great an *Impetus*, ſo as to produce more vivid Spirits, which rapidly make Excurſions on all Sides; or when a more vehement Perſpiration has the ſame Effect upon the Blood; or a ſtronger Compreſſion upon the Brain; or whenſoever ſome, or all of theſe Cauſes ſubſiſt. Hence likewiſe ariſe Tumors and Convulſions, as it appears from what we have ſaid concerning *particular Diſeaſes*, and the Effects of a *Stimulus* on any Parts of the Body.

Sneezing proceeds from the *Stimulus* of a ſharp Blood; as likewiſe ſtretching from the ſame *Stimulus* upon the Muſcles; and both ſneezing and ſtretching may be the Effect of the thicker Parts of the Blood giving uneaſy Senſations, as we are accuſtomed to throw off every thing that is troubleſome by ſhaking and moving the diſturbed Parts.

Hoarſeneſs ariſes either from the Puſtules endeavouring to break out about the Throat, or by Viſcidities furring over thoſe Parts, or by their too great Dryneſs from the Heat of the Fever, or from ſome or all of theſe Cauſes, whereby the internal Coats of the Wind-Pipe and adjacent Parts are rendered leſs ſmooth. A Cough is alſo an Effect of the ſame *Stimulus*, either from a Collection of Matter, or from a parching and vellicating Heat.

Difficulty of Breathing comes from an Afflux partly of an hot, and partly of a thick Blood; by the former it comes about that the Lungs are more dryed, and conſequently more difficultly moved, becauſe in ſuch a Caſe they are both unfitter for Coincidence and Dilatation; and by the latter, is made, as it were, the Beginning of a Tumor, or an Obſtruction within the Veſſels; to remove both which troubleſome Senſations we are accuſtomed more frequently to move the Breaſt, and with greater Force, which muſt reſemble a more difficult Breathing; and without any ſuch Cuſtom or Endeavour, the Breaſt will likewiſe be more frequently agitated, and more ſtrongly, from the *Stimulus*, and therefrom too a greater Difficulty of Reſpiration.

From the ſame Fervour of Blood, Heat and Redneſs, and a Senſe of pricking is perceived all over the Body; for the Heat extends it ſelf to the extreameſt Parts, becauſe the *Lentor* in this Caſe is not ſo viſcid, but more inclinable to Fermentation, and to ſet at Liberty its igneous Particles; and when the Blood alſo ferments, in Order to obtain more Room for its Motion, it diſtends the capillary Arteries, from which Diſtraction ſome Particles tinged with Blood will penetrate the Coats, and ſtain the Skin with a much higher Red. But the Senſe of Pricking is from the ſame Heat, and a more compact Matter, endeavouring its Eſcape while it ferments, until at laſt it breaks out into ſuch Puſtules or Efloreſcencies as in the Meaſles. And from theſe ſame Cauſes proceed great Anxiety and Inquietude, as frequently explained above.

From this ſame Acrimony will the Matter ſupplying Tears be more ſharp, and therefore more irritating upon the Glands ſeparating them; which Irritation will contract their Coats, and the ſooner compreſs out that Humour derivable from the Blood, which is deſtined to be there ſecreted; and hence Tears will flow without any Inclination or Paſſion of the Mind, which cuſtomarily occaſions Weeping;

and this Effuſion of Lymph from the lachrymal Glands will be alſo rendred the more eaſie from that Preſſure that is in the adjacent Veſſels, through which the Blood cannot readily flow, both by Means of the Rarefaction of its more fluid Parts, and the Obſtruction of its more viſcid ones; and from the Thinneſs of the Humour which is ſeparable into Tears. But from the Nature of a fermenting and ſtimulating Blood, the Eyes will likewiſe ouze out ſomewhat mattery, and the hinder Parts of them will ake from the Straitneſs of the Veſſels pulling them backwards into their Sockets, and which Straitneſs is the Reſult of a thick, or a ſharp Blood, or a Blood abounding in both theſe Qualities; the Eyes will likewiſe ſparkle, and ſhine by Means of the parching Heat, and the Subtilty of the Humours thrown into them, and giving a ſhining Tranſparency. The Countenance will be alſo red from the ſame Cauſe, as is aſſigned for it on other Parts; and therefore when the Blood comes there to ſtop, it will ſtretch the Veſſels outwards, and occaſion both the Eruption of Puſtules, and the Intumeſcence accompanying them.

And this Fermentation and Change of Blood will be on a ſudden, as if Nature had, through the whole precedent Courſe of Life, been endeavouring ſuch a Change by ſlow and imperceptible Degrees, and to which at laſt, as ſoon as ſhe hath arrived, the whole Strength of the Conſtitution is exerted to ſeparate the Blood into groſs and fluid Parts, or ſome partaking of both Natures; and thus a Fever comes to ſeize a Perſon on a ſudden, like a *Synochus*, attended with all the Symptoms as in that, from the Beginning, to the Height of the Diſeaſe.

Concomitants.

But by one, two, or more Returns, the whole Maſs of Blood, and this Matter particularly in it, will be ſo far fermented, that it will not only make Efforts for Eruption, but actually break out into Puſtules; the Matter therefore thus breaking out, will be either ſuch as requires further Fermentation to get through the Cuticle, or ſuch as is able to make its Eſcape by Perſpiration, without any further Preparation; *that* will accumulate in large Parcels, as a great deal of Time is required before it can be rendred fluid, by Suppuration; but *this* will lie upon the Skin in leſſer Portions, and cover it only with a Kind of

Scurff; as it is not only much thinner in Conſiſtence, but alſo by its Smalneſs in Quantity it penetrates the Membranes, whereby it does not riſe into Eminencies and Tumours; and for the ſame Reaſon, they are diſcuſſed without Separation in a ſhort Time; that is, in about five Days. And theſe Eruptions may, and ought to break out with great Redneſs, becauſe it is the moſt thin and ſubtle Part of the Blood that ſettles upon the Place of Eruption, and by its Fermentation there, the moſt ſubtle and thin Parts only come into Sight. For the ſame Reaſon alſo the larger Puſtules appear with Redneſs and Inflammation, whence the *Small-Pox*, that is, theſe larger Puſtules, ferment and come to Suppuration; the other are the *Meaſles*, and ſo called. But theſe alſo may change into other Colours by various Circumſtances and Accidents, as it abundantly is manifeſt from what hath been already explained in the *Twenty firſt Propoſition*, concerning a *malignant* Fever.

If this Change in the Blood's natural Cohæſion is moderate, and nothing is forced from it that is very thin and active, but ſomewhat only that is fluxile, yet mixed at the ſame Time with Viſcidity, Aquoſity, and Phlegm, the Pu-

Puſtules which break out will be whitiſh Veſicles, full of a ſerous Humour, which in a ſhort Space will break and dry away, in three Days perhaps; and in this Caſe there will be no Danger, for ſuch may riſe even without a Fever. And theſe Puſtules will break either by too great a Diſtention from the included Matter, or from the Rarefaction of its fermenting Qualities; and they will dry away, becauſe there is no Supply of Moiſture to preſerve them.

When, again, theſe Puſtules are red, they muſt therefore contain a Matter not far deviated from the Nature of real Blood, and on that Account will they be the leſs dangerous.

When they are white, the contained Matter will approach the nearer to the Nature of Phlegm or Lymph, that is, ſomewhat of very little Energy, and therefore unapt to ferment or corrupt, and conſequently of a good Indication.

If they are ſoft, they are from a leſs obſtinate Viſcidity, that cannot raiſe a very aggravated Fever, but eaſily ſuppurates, and is attended with no Danger.

When they are few in Number, it is an Argument that the generating

Viſcidity is but ſmall in Quantity; that is, ſuppoſing all that ought to come out is ſo; and not only Part of it, and that too which is moſt fluxile, leaving the thicker and more miſchievous behind; and therefore when the *Small-Pox* are thin, it is a good Sign.

Further, When the Puſtules are diſtinct, it is a Proof that the peccant Humour does not abound, which it is neceſſary to do in Order to thruſt more out, and thicken them, as is hereafter to be proved.

When they are round, it is a Demonſtration that the Matter filling them is ductile, and reſolvable by Fermentation, whereby it is capable of being lifted up into a more elevated Form, and accommodating it ſelf to the Figure moſt natural to any Fluid of an equable Conſiſtence. And in all theſe Circumſtances of the *Small-Pox*, there eaſily is a healthful Termination, and a thorough Recovery.

When theſe Puſtules break out only upon the Surface, then the *Ichor* upon breaking them, or the Matter, if they are ſuppurated into little Ulcers, will only ſpend it ſelf upon the outward Parts, nor will reach to any Part of Moment, nor be mixed with the Chyle, or Blood, whence there will be no Danger: But when theſe Puſtules riſe in the *OEſophagus*, Stomach, or upon any *Viſcus*, whether they ſuppurate, or break before, the *Ichor* or *Pus* will generate little Sores, nay ſometimes Ulcers of ſome Bigneſs, upon one internal Part or another, and will mix with the Chyle and Blood, ſo as to give Riſe to other kinds of Fevers, and many other Diſeaſes; and therefore muſt the *Small-Pox* riſing inwardly be attended with much Hazard: For this Eruption upon the *Viſcera* argues a great Obſtinacy in the *Lentor*, that cannot be broke, and render'd fluid by the internal Heat.

When a ſlight Fever preceeds the Eruption, or ceaſes upon the Eruption, or is much leſſen'd, it proves the Quantity of Humour to be either expell'd, or ſmall and mild in its Qualities; and therefore in this Circumſtance a Recovery may be ſafely prognoſticated; and the more ſo likewiſe, when all other Symptoms are proportionably favourable, particularly the Voice clear, and Reſpiration eaſy; for the Clearneſs of the Voice ſhews that no Puſtules are about the Paſſage of the Breath, as the Breaſt, Wind-Pipe, and Throat; and an eaſy Reſpiration proves that the peccant Humours flow eaſily through the Lungs, that they can eaſily be concocted without any further Fuſion of the Blood; that is, that they are not much degenerated from a natural State.

But ſuppoſe the Puſtules break out ſlowly, it is a Proof that the peccant Matter is obſtinate, and not eaſily yielding to Fermentation and Solution, whence its Continuance in the Blood will be long; that its Adhæſion to the Arteries will be very great; that it will contaminate the whole Maſs; and bring the Life into Danger.

When they are many in Number, it argues an abundance of peccant Matter, which by the Greatneſs of its Quantity cannot be eaſily and wholly detatched away by the Skin; when they are large, or double, or confluent, it is a Sign alſo of the ſame Exceſs of peccant Matter.

When they are depreſſed, the Matter difficultly ferments, and hath not Energy enough to diſtract the Membranes, and raiſe them into Puſtules of greater Eminence; which proves it to be very viſcid, and hard to be diſſolved, whence the ſame Hazard.

When the Puſtules are hard, it is a Sign of the ſame Tenacity in the peccant

Matter, and its Difficulty to Solution.

In Caſe they are green, livid, black, and leſs tranſparent, they then muſt be raiſed by Matter that is tough and hard, and which, before it can be diſſolved, will cauſe the whole Maſs of Blood to be brought into Fuſion, and conſequently perverted in the higheſt Degree from its natural State; but if it cannot be diſſolved, it will then remain in the Blood, ſo as to occaſion great Hazard.

But becauſe the Membrane which incloſes a Puſtule is the moſt diſtracted and tenſe all round at its *Baſe*, therefore at the Tip or Point it will be more yielding, and give leſs Reſiſtance to any evaporating Humour, while the other Parts of its Circumference are more hard and compact, and conſequently leſs perſpirable, and more compreſſing the contained *Lentor*, than at the *Vertex*; ſo that the whole *Niſus* of Expiration will be at the *Vertex* of the Puſtule; while therefore the Matter ferments and perſpires at the *Vertex*, whither its whole *Niſus* is inclined, there appears a Blackneſs, although all the reſt of it is of a well conditioned Colour; ſuch Blackneſs muſt be from ſomewhat collecting at the

Point of the Puſtule; but this which gathers at the Top is moſt thin, that is, moſt capable of Perſpiration; and conſequently what Part of it ſticks in a Place moſt tranſpirable, muſt be leaſt fluid, and obſtinate, and eaſily reducing the Blood into a State moſt remote from what is natural; and therefore put the Life into great Hazard.

The Reaſon and Neceſſity of Danger is not much unlike from a Mixture of Purple-ſpots in the Interſtices of Puſtules that are better coloured, and which Spots will be yet of a much more fatal Importance when they prove livid or black, as it appears from what hath been already ſaid in the *Twenty firſt Propoſition* concerning a *malignant* Fever.

But when the Puſtules diſappear immediately upon their firſt Eruption, and the Matter cannot be evaporated, or ſuppurated, whereupon it regurgitates into the Maſs of Blood; or when it can evaporate, or ſuppurate, if ſuch Procedure is ſtopped, while ſome remain yet in the Blood, there muſt ſubſiſt ſome Cauſe that can put a Stop to ſuch Procedure, and which as it cannot be ſuppoſed any thing external, it muſt be ſomewhat intrinſically in the Blood, and coagulating it into a yet greater *Lentor*, which cannot be thrown off towards the Skin, and muſt therefore yet more contaminate the Blood, or obſtruct the Veſſels, or do both.

The neceſſary Conſequences of theſe Affections will be black Urine, or black Stools, ſeparated from a Blood that is wholly fermented, and coagulated into *Lentors* difficult to move; or from a Mixture of Blood from an Eroſion of the Veſſels by the acrid Humours; or their Diſruption from obſtinate Obſtructions; or from pure Blood venting it ſelf by its Acrimony; or the Compreſſion of neighbouring Obſtruction. And for this Reaſon an Hemorrhage at any Part is dangerous, and eſpecially after a Suppreſſion of the Puſtules, and from the ſame Cauſes already enumerated concerning the Excrements of the Inteſtines, and the Urine.

Where the Fever is great, it is an Argument of a great deal of Matter to be thrown out in Puſtules, and conſequently dangerous; and when it does not yet ſink upon their Eruption, it is a further Proof that a great deal more yet remains in the Blood to be thrown out, which therefore may ſo change the Blood, as to continue the Fever; that is, it will be changed into a State as remote as poſſible from a natural one, and very eaſily paſſing into a total Obſtruction, that is, Death. What remains is it ſelf manifeſt; and therefore the whole *Propoſition* is true.

The *Small-Pox* therefore is a Fault in the Quality of the Blood, whereby it loſes its natural Cohæſions, and becomes both more thick and more fluid, whence the whole Series of Affections before enumerated are produced, and from a Collection of which is conſtituted that Fever, which is called the *Small-Pox.*

PROPOSITION XXXI.

The Antecedents *to a* Periodick intermitting Quotidian, *may change the Blood in its Motion, Quantity, or Quality; but its* Concomitants *and* Conſequences *are the neceſſary Reſult of its vitiated Qualities: and what this Fever is.*

All that now remains to be explained concerning Fevers, requires but very little Trouble; for what we have already explained in the foregoing and general *Propoſitions*, premiſed to *periodick* Fevers, as well as in thoſe very *Propoſitions* themſelves, do naturally demonſtrate all that belongs to any other Kinds of intermitting Fevers. And indeed as the *Antecedents* to an *intermitting Periodick Quotidian*, are the ſame as to a *continued Quotidian*, it is manifeſt that the ſame Effects will be produced by them as in a *continued Quotidian*; and that the Affections of an *Intermittent* ariſe from the ſame Cauſes as thoſe of a *Continuent*; and further, that as thoſe of a *Continuent* proceed from a *Lentor* of the Blood, or its vitiated Qualities, after the like Manner they are produced in an *Intermittent* from the ſame Cauſes.

Antecedents. Thoſe *Antecedents* therefore which we have enumerated to belong to a *continued Quotidian*, and agree with the *Antecedents* to an *Intermittent*, are not worth our while to explain here over again: The diminiſhed Warmth of the *Viſcera* is reducible to a moiſt Conſtitution; a cold and moiſt Diet, to the Condition of Children who ſuck, or want Teeth, and to a Surfeit; a Corpulency of Body, to a viſcid State of Blood; and a pale Complexion is always

ways a certain Sign that the Blood is deſtitute in a great Meaſure of its florid Parts, or of whatſoever ſhould raiſe its Colour, and conſequently abounds with phlegmy and cold Humours; a Straitneſs or Narrowneſs of the Arteries checks the Blood's *Impetus*, and retards its Solution, whence it is rendred colder, thicker, and more phlegmy; much Sleep, eſpecially after Eating, is alſo reckoned amongſt the *Antecedents*, becauſe it favours the Lodgment of all the Humidities of the Food upon the Parts, as for Want of Motion they are not ſeparated from the Blood, and diſſipated by Perſpiration, which they otherwiſe would be for the greateſt Part.

Concomitants.

Many of the *Concomitants* are ſo eaſie to be underſtood, that they want not Explanation; for in ſuch a Conſtitution of Blood, as here ſuppoſed, that *Mucus* or Viſcidity of the Blood will eaſily be generated; that is, ſuch an one as will entangle the igneous Particles, and adhere in ſuch Manner to the capillary Arteries, that by the continual Afflux of ſucceeding Blood, and the natural *Niſus* of the Particles contained in the *Lentor*, it may be wholly waſhed away, and carried into the Veins, ſo as to return again in any given Space of

Time, and which Experience hath taught us to be about 24 Hours; and when nothing of it remains in the Arteries, the Body will be left entirely free between every Paroxyſm: And becauſe while ſome Part, or all, of this *Lentor* is wearing away from the Capillaries, it may be expelled either by Urine or Sweat, the Patient therefore will diſcover it by both; in like Manner alſo may ſome Part of it be thrown off by Stool, by Vomiting, and any other Ways, according as it is ſuited for the Excretion of any particular Glands, or Emunctories. If indeed it cannot be ſeparated in the firſt Day, neither Sweat nor Urine will be affected by it; yet after many repeated Circuits the *Lentor* will be more ſubdued, and rendred fluxile; and during this Time, the Urine will be pale, crude, and thin, becauſe the earthy and groſſer Parts are not yet enough in Separation to be ſtrained along with it in the Kidneys. Its Attacks will be with a ſlight Cold, becauſe of its Entanglement of the igneous Particles, and the Heat will with Difficulty break into Liberty, both becauſe there is but little of it in ſuch a cold Conſtitution, and becauſe there is but little Motion and Agitation, *&c.* all which is manifeſt at firſt View. All Things will happen likewiſe in the ſame Manner, if the *Lentor* of the firſt Fit is wholly conſumed, and at the End of one Day another *Lentor* is generated of the ſame Nature, and thrown again after the ſame Manner into the Capillaries; as is manifeſt from the preceding Demonſtrations.

Conſequences.

But if this Fever be longer protracted, ſo that the Humours and whole Habit are vitiated, inſomuch that neither natural Juices can be generated, nor their Appoſition for the Nouriſhment of the Body be performed, then there will enſue a Cachexy; where ſo much Water abounds, that it ouzes through the Veſſels, there will be generated a true Dropſie, whether the Veins or Lymphaticks are ſo compreſſed by the Tumours of any Parts, ſo that their Lymph is ſqueezed through them, or the Lymphaticks by ſuch Compreſſion are quite broke; in which Caſe not only a Dropſie, but likewiſe a Carus, or a Lethargy may follow from the Lodgment or Accumulation of ſo much watery Humours upon the Brain.

A *Periodick intermitting Quotidian* is then a Fault in the Quality of the Blood, wherein a *Lentor* capable of entangling its igneous Particles is accumulated in the capillary Arteries, but again entirely waſhed away; whereupon if the whole be conſumed, a like *Lentor* is generated in the Space of one Day, or derived from ſome other Part, to be again obſtructed in the Capillaries; which again is wholly waſted or not, and recurs every 24 Hours with all its *concomitant* Affections.

PROPOSITION XXXII.

The Antecedents *to a* Periodick intermitting Tertian, *may vitiate the Blood in Motion, Quantity, or Quality;* *but its* Concomitants *and* Conſequences *are the neceſſary Reſult only of its vitiated Qualities: and what this Fever is.*

Antecedents. With like Eaſe is this *Propoſition* demonſtrated as the former; for the *Antecedents* to an *intermitting Tertian* are the ſame as to a *Continuent*, whence from the like Cauſe are the ſame Effects, and Neceſſity of Production; ſo that it is not needful to explain them again particularly here, as it is already manifeſt how they can vitiate the Blood in its Motion, Quantity, or Quality, although its vitiated Quality only is the neceſſary Cauſe of all its Affections, and which vitiated Quality is nothing elſe than a *Lentor* produced from its *Antecedents.*

But here it is requiſite to obſerve with Relation to *Intermittents*, that when the *Lentor* is of one Kind only, that is, altogether pituitous, (to uſe the old Terms) or bilious, or melancholy, there will be generated *legitimate Intermittents*; but when the *Lentors* are from ſome Cauſe or other not thus ſimple, but conpounded with one another, then are produced ſpurious *Tertians*, *Quotidians*, and *Quartans*. It is alſo further to be remarked, that as often as it is aſſerted that the *Antecedents* to *Intermittents* are the ſame as the *Antecedents* to *Continuents*, and conſequently that the *Concomitant* and *Subſequent* Affections are neceſſarily the *ſame*, it is not to be underſtood with the utmoſt Reſtriction; for they are pronounced the *ſame* only in Kind, and not in Degree of Efficacy; thus Age occaſions Cold and dry Juices, and thereby changes the Blood into a *Lentor*, and on that Account Age will produce the Requiſites to an *intermitting* or a *continued* Fever; but becauſe the Dryneſs may be greater in one Body than in another, and therefore the

Lentor generated in one will be dryer than in another; that is, more adhering to the Arteries, and more entangling the Heat, ſo that in ſuch an one will be produced a *continued Quotidian*; but in another, where the *Lentor* leſs adheres to the Arteries, and leſs reſtrains the Heat's Activity, although it be from the ſame common Cauſe, Age, but differing in Degree of Operation, it will produce an *intermitting Quotidian*, and ſo of the reſt.

Concomitants. Let it then be ſuppoſed that from the ſame *Antecedents* is produced a *Lentor* in the Blood, more dry than that of a *Quotidian*, but ſuch as is capable of Protruſion through the Arteries, and of more ſtrongly entangling the Heat; the Cold then will be intenſe; and as ſomewhat is joined with the *Lentor*, which is alſo at the ſame Time ſtimulating, with the Perception of Cold will be joined a Perception alſo of pricking; but when the *Lentor* is got through the Capillaries, the Cold will go off. And further, if this *Lentor* is not conſumed, nor either Sweat or Urine ſucceeds, as it is ſuppoſed dryer than the *Lentor* waſhed into the Veins in a *Quotidian*; it will re-accumulate in the Arteries more ſlowly, as Experience teaches us that the Time of its Return is in about three Days: But it may yet be waſted without any ſenſible Diſcovery of it in the Secretions, which is alſo true of the *Lentors* producing a *Quotidian*, and a *Quartan*, that is, when it is digeſted into perſpirable Matter. Although when it does not perſpire, and it is ſo diſſolved that it is brought by the Blood's Current to the ſecretory Glands, without any further Adhæſion in the Capillaries, it will then be ſtrained off by thoſe Glands with their common Excrements; after which, if no new *Lentor* is generated in the Arteries, the Patient will be quite recovered; but if another *Lentor* of the ſame Kind be produced then, it will prove a *Periodick intermitting Quotidian*; becauſe the *Lentor*, during ſuch a certain Space, is wholly carried away, and leaves the Body in entire Health. And theſe with all other Circumſtances ranked amongſt the *Concomitants*, abundantly appear from what hath already been explained.

When the Urine hath in it a pale Cloud, at the Beginning of this Fever, or what is called an *Eneorema*, it ſhews that ſome Part of the *Lentor* which is moſt ſolvable, is mixed therewith in very ſmall Diviſions, that is, in Particles that are moſt ſuſceptible of Motion, and of very weak Cohæſion, which is the Cauſe of its Solution ſo ſoon, in the Beginning of the Fever; wherefore if Nature does not deſiſt from this Procedure, but continues the Solution, the *Lentor* will in a little Time be wholly diſſolved, and which is commonly finiſhed by the fourth Fit; but that does not always neceſſarily happen. When the Urine is red, it diſcovers that the hard Particles abound in an over-Proportion to the Humidities in a natural Quantity, or that the Humidities have not their natural Proportion to the rigid Particles in due Quantity.

The more groſs Particles of the Urine abounding in Quantity greater than natural, ſhew the *Lentor* to be dry, copious, and difficult of Solution, which will protract the Fever to a longer Space; but a Proportion of Humidity leſs than natural argues a great Degree of Heat, which waſtes it, and renders the *Lentor* more tenacious, that is, leſs diſſolvable, which will alſo protract the Fever; or the *Lentor* may in it ſelf be ſo conditioned, as to implicate and entangle that Humidity, which otherwiſe would waſh away by Urine.

When the Urine is without a Cloud, or an *Eneorema*, it diſcovers that no Part of the *Lentor* is broke away, and conſequently that it is of ſuch a tough Conſiſtence, as will not eaſily yield to Solution, but will therefore protract the Diſtemper. And when this happens, we experience the Fever to laſt to the ſeventh Fit, although it does not always neceſſarily follow that it ſhould then finally terminate.

But becauſe the Sediment in the Urine is the moſt rigid or groſs Parts, and its Levity and Equality depends upon an equal and perfect Solution of the ſame Matter, that Urine therefore which lightly and equally ſubſides the firſt Day of the Diſtemper, ſhews that the moſt rigid Particles which are the Cauſe of the Diſeaſe are already diſſolved, or in Readineſs ſo to be, and therefore that the Diſeaſe will ſoon terminate. And where therefore this happens, even in a *Tertian*, it will not long continue, but commonly finiſh its Courſe with the third Fit.

This *Lentor* will alſo break away, and lodge in Eruptions about the Noſe and Lips, either becauſe it is changed into ſomewhat near to the Nature of the *Saliva*, and conſequently moſt ſeparable by thoſe Glands; or for the ſame Reaſon as was before aſſigned for the Eruption of of Puſtules rather about the Hands, Feet, and Face, than on the Breaſt or Back.

Conſequences.

It appears from the *general Propoſitions*, that *Intermittents* are not without ſome Hazard; and a *ſpurious Tertian* will ſucceed, when the *Lentor* that is genuine and equable, is mixed with a new generated *Lentor* of a different Kind, or is in Part changed. Wherefore the whole is demonſtrated.

A *Periodick intermitting Tertian* therefore is a Fault in the Quality of the Blood, wherein there is generated a *Lentor* more tenacious than that of a *Quotidian*, apt to entangle the Heat, and adhere to the capillary Arteries, yet ſo that it may be wholly waſhed away, and recur again every third Day; and this will be either wholly waſted in every Paroxyſm, and generated afreſh, or partly waſted and joined by a new one, every third Day recurring, which will produce all the enumerated Affections.

PROPOSITION XXXIII.

The Antecedents *to a* Periodick intermitting Quartan, *may vitiate the Blood in its Motion, Quantity, or Quality; but its* Concomitants *and* Conſequences *do neceſſarily depend only on its vitiated Qualities: and what this Fever is.*

Antecedents. We may very ſoon diſpatch this Head; for the *Antecedents* are the ſame as thoſe to a *continued Quartan*, and therefore may be underſtood from what hath been explained concerning them; and what are further enumerated under this Diſtinction are very plain, both in themſelves and from the foregoing Demonſtrations. For by them is produced a *Lentor* cold and dry, and much more incapable of Motion in Compariſon to the *Lentors* which make a *Quotidian* or a *Tertian*; but yet ſuch an one as can be wholly waſhed out of the Capillaries, after it hath ſome time adhered therein.

Concomitants.

This therefore muſt be more groſs in its conſtituent Particles, from whence, when it is lodged upon the Muſcles, it either ſtimulates them to their natural Contractions, or gives ſuch a Senſe of Uneaſineſs, that we endeavour voluntarily to move them; hence when it comes firſt to ſettle, and a leſs Quantity only is lodged, it does not occaſion any Senſation of greater Uneaſineſs than what incites to yawning and ſtretching; then we perceive ſomewhat reſtleſs and troubleſome unequally ſpreading all over the Body, which muſt be Portions of *Lentor* accumulating in this or that Part without any certain Order; and to this Senſation ſoon follows that of Cold, as the viſcid Matter gradually collects in the Capillaries, and flows through the Arteries but ſlowly, until it is all gathered upon their Extremities when the Senſe of Cold appears very great; and it will be alſo accompanied with a Weight, and an Appearance of Contuſions of the Bones themſelves, as is manifeſt from the *general Propoſitions.* But from hence it will gradually be wore away, and by Means of its natural Coldneſs give ſome Reſtraint to the Activity of the igneous Particles, wherefore the Heat will even then be remiſs, becauſe it cannot by a ſlight Compreſſive Force be extricated from ſuch cold and ſolid *Moleculæ.* The other *Concomitants* appear from what hath been already ſaid, and the Paroxyſms return but every fourth Day by Means of a *Lentor* which moves very ſlowly.

Conſequences.

Conſequent to theſe Circumſtances ſucceeds a ſhort *Dyſentry*, that carries off the whole Quantity of *Lentor*; and this will be the more ſalutary the ſhorter it is: For when it is of long Continuance, although it be ſuppoſed to carry off all the *Lentor*, and is a Sign of a thorough Fuſion in the Blood, yet it may happen to carry off ſo much Humidity, as to leave the Maſs of Blood very dry, whence will ariſe many Diſorders, and ſuch as may bring the Life of the Patient into great Hazards. And for this very Reaſon, *Lienoſis difficultas Inteſtinorum, bonum*; that is, ſuppoſing it ſhort, as we have already taken Notice, and as manifeſtly appears from that other Paſſage of *Hippocrates*, *Qui lienoſi difficultate Inteſtinorum corripiuntur, iis longam ſupervenientem Dyſenteriam aquæ inter cutem, tum levitas Inteſtinorum excipit, & moriuntur.* Where it is plain that a long *Dyſentery* is bad, and that ſuch are afterwards ſubject to a *Dropſy* from that Dryneſs, which hinders the Circulation of Lymph, by the Contraction and Cloſeneſs of the Veſſels; or elſe Death neceſſarily ſucceeds from the ſame Quality of the Coats of the Inteſtines, whereby the Apertures of the Lacteals are ſhut up. A *Dropſie* is therefore a *Conſquence* by Means of ſuch Dryneſs; and a *Scurvy* from this Diſtemperature of the Humours, eſpecially where there is a Fault in the *Viſcera* preparing them.

It is fatal to old People, eſpecially thoſe above Sixty; becauſe at ſuch an Age there is the greateſt Degree of Coldneſs and Dryneſs, which therefore being aggravated by the Aſſiſtance of a Diſeaſe that is hot and dry, muſt bring it to an Extremity, and the Patient will die.

But if it be changed into a *Continuent*, it will yet be fatal, becauſe that will be the Effect of an aggravated Dryneſs, wherein the Blood will be yet more fuſed, from the obſtinate Adhæſion of the *Lentor*, and its greater Remove from a natural State.

An Hemorrhage at Noſe will be in like Manner dangerous; either from the Acrimony of the Blood breaking through the Veſſels by its Eroſion, or from its groſneſs forcing them aſunder by Compreſſion; when it obſtructs upon the ſame Veſſels, it burſts, or thoſe neareſt to them. For ſuch Eroſion will be attended with a Dryneſs, and many other Inconveniencies, and a thick Blood, which loads and preſſes upon the Veſſels, will with the moſt Difficulty be reduced to its natural State. If therefore by this *Lentor* the Blood is ſo vitiated, that no good Juice can be contained in it, nor added to the Nouriſhment of the Parts, the Body muſt become lean, and fall into a *Cachexy*. And therefore the whole *Propoſition* is demonſtrated.

A *periodick intermitting Quartan* then is a Fault in the Blood, wherein a certain *Lentor* is produced that is fitted to entangle the Heat, and adhere in the Arteries, but may be wholly carry'd out of them again, and recur every fourth Day, *&c.* as above.

PROPOSITION XXXIV.

Of a Semitertian *and* Erratick *Fever.*

A Semitertian

From what hath been demonſtrated at the Cloſe of the *Nineteenth Propoſition*, it appears that ſome Kinds of an *Intermittent* may be joined with a *continued Periodick Fever*, although *that* is produced by a *Lentor* which adheres to the Arteries for ſome Time, and is again wholly waſhed away, and *this* from a *Lentor* continually reſiding in them; and therefore from the ſame *Propoſition* it appears what a *Semitertian* is, and how it is produced, that is to ſay, a Fever compounded of a *continued Quotidian* and an *intermitting Tertian.* In this then the Returns will be with Cold every third Day; and the like may oftener happen, as that *Lentor* which confines the Heat recurs with Uncertainty; and hence the frequency of the Returns is eaſy enough to be conceived, becauſe ſuch a Compoſition of two Fevers, proceeding from two *Lentors*, argues the Blood to be greatly vitiated, and as it were turbid, in ſome Parts fluid, and in others viſcid, like to that Conſtitution of Blood which we have deſcribed in a *malignant* Fever.

Hence it comes to paſs that this Kind of Fever is of all the moſt dangerous, the Blood being greatly perverted from its natural State, and every where depoſiting ſuch *Lentors* as are the Origin of very ſudden and fatal Evils. The Mouth of the Stomach is affected by the Derivation of diſtemper'd Juices to it; Diſorders of the Head, and conſequently of the whole nervous Syſtem, are produced by an Accumulation of *Lentors* compreſſing it, and cauſing a diſorderly Generation and Derivation of Spirits; Syncopies are produced either by Conſent from the Stomach, or immediately, as appears from *particular Diſeaſes*, and a *Syncopalis*; a *Diophoreſis* from Compreſſion or Fermentation, by Obſtruction or Heat; Thirſt, and an inward Uneaſineſs from Heat, from Irritation of the moſt fluid Parts, and from an over ſtock of Spirits breaking forth with great *Impetus* againſt obſtructed Parts.

Erratick Fevers.

Erratick Fevers appear from their *Antecedents* to be produced from different *Lentors*, recurring at different Times, in no Order or Certainty, as is confirmed by their *Concomitants*, if they are compared with what hath been already explained, and are conſidered according to their own Neceſſity of Operation. But becauſe by *Lentors* of this kind producing a Fever and its Returns, it is neceſſary that the Blood, continually agitated by an unnatural Heat, ſhould loſe all its Humidity, it muſt become very dry, that is, diſpoſed to produce a *Lentor* generating a *Quartan*; in which it will at length ſettle, if the Heat is not ſo great as to overcome the Cold; and hence it comes about that a *Quartan* is apt to ſucceed *Erratick* Fevers; but an *Hectick* will ſucceed when the Heat predominates.

It hence therefore appears, that no Kinds of Fevers can be generated from a *Semitertian*, or *Erraticks*, that is not comprehended in ſome of the preceding Diviſions, or that depends upon any other Cauſes than the *Lentors* above explained, and therefore that they are to be included under, and defined by them. But from the *Eighteenth*, *Nineteenth*, *Twentieth*, and *Twenty firſt Propoſitions*, it doth not only appear, that all thoſe *Antecedents*, *Concomitants*, and *Conſequences* of Fevers, which we have enumerated from the Relations and Methods of others, may continually occur in Practice to a diligent Attention, but alſo their Orders of Invaſion and Change, with many other Particulars.

PROPOSITION XXXV.

A Fever is a Fault in the Blood's Motion, Quantity, or Quality, or in ſome or all of them.

Becauſe then there is no Fever producible beſides the forementioned, or becauſe if there can be any other, it is reducible to thoſe; and that every one of them is a Fault of the Blood in its Motion, Quantity, or Quality; therefore a Fever is nothing elſe than this Fault of the Blood either in its Motion, Quantity, or Quality, whether ſome or all of theſe primarily happen, in ſome or all Kinds, which was to be demonſtrated.

From theſe may innumerable *Corollaries* be deduced, which every one may do for himſelf, *&c.*

FINIS.